FIVE BOOK SERIES

TARR & McMURRY'S GEOGRAPHIES

THIRD PART

NORTH AMERICA

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NORTH AMERICA

WITH AN ESPECIALLY FULL TREATMENT
OF THE UNITED STATES AND
ITS DEPENDENCIES

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TARR AND McMURRY GEOGRAPHIES

THIRD PART

NORTH AMERICA AND SOUTH AMERICA

BY

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WITH NUMEROUS MAPS AND MANY ILLUSTRATIONS, CHIEFLY PHOTOGRAPHS OF ACTUAL SCENES

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PREFACE

The plan of this series of geographies devotes the entire second volume to North America, thus providing space for a much fuller treatment than has heretofore been customary. In this treatment the authors have left the beaten track to such an extent that some words of explanation seem called for.

Physiographic Basis. — The first four sections are given over to a consideration of certain necessary facts and elementary principles of physiography.

While considerable space is devoted to this physiographic basis, an examination of the text will show that this space is used, not so much in introducing new physiographic matter, as in more detailed statements and explanations. Recognizing the inherent difficulty of the subject for young minds, and believing that, as ordinarily presented in the books, the children fail to grasp the significance of the important basal principles, the authors have attacked the problem in a new way.

In the first place, they have approached the subject differently. Secondly, their controlling idea has been that only so much physiography should be introduced as is actually demanded to explain man's relation to the earth. With this view much physiography which has found its way into some of the modern text-books has been elimi-

nated; but that which has been retained has been deemed worthy of a fuller treatment than it ordinarily receives. The human relationship is pointed out in the sections on physiography, and again and again in the succeeding sections.

Causal Sequence. — The authors believe that rational geography must rest upon such a physiographic foundation. It is physiographic conditions which most often furnish the reasons for the location of human industries, the development of transportation routes, the situation of cities, etc. In other words, when the physiographic facts about a given region are clearly grasped, most of the other geographic facts easily arrange themselves as links in a causal chain. Thus the many details touching a certain locality are taught in relation with one another, so that they approach the form of a narrative, rather than that of a mere list of assertions.

It does not necessarily follow that a given class of children should *always* begin with the physical features in the study of each section of country. For one reason or another some other portion of the causal series may serve as a better beginning. But the authors are convinced that in a text-book, written for large numbers of children endowed with varying apperceiving experiences, the physiographic features must furnish the best general starting-point in the explanation of the facts of political, commercial, and historical geography.

Types. — Another characteristic of this volume is that it contains comparatively few topics, but deals with each one at some length. As was suggested in the Preface of

the First Book, the basal units for the study of geography, although constantly in use, are seldom adequately presented in the text. This applies strikingly, for example, to such topics as farm, cattle ranch, irrigation, lumber camp, and factory. In order to remedy this defect as far as possible, each subject of such a kind is presented with as much detail as space permits, and in connection with that section of country in which it seems most prominent.

For example, lumbering, fishing, and the manufacture of cloth, boots, and shoes receive their most detailed treatment in connection with New England; the mining of coal and iron ore and the manufacture of iron goods are discussed in connection with the Middle Atlantic States; and gold mining, irrigation, and grazing are naturally included under the Western States.

The industries and objects thus described, being fairly typical of industries and objects found in other sections, are on that account worthy of being called *types*. Through the careful presentation of such types, vivid pictures and the appreciation of the pupils are assured.

Reviews. — The fact that a given industry in one section is in many respects unlike the same industry in other sections, offers no obstacle to this plan. Lumbering in Maine necessarily involves the essential features of lumbering in any place. Consequently, having built up a clear conception of the occupation in that locality, all that is necessary when lumbering in the Southern States, or in Michigan, or in Washington is studied, is to review what was formerly learned and state the principal points in which the conditions in the new region differ

from those already described. Likewise, after the mining of ore in Pennsylvania is taught, the understanding or comprehension of the same industry as carried on about Birmingham, or in northern Michigan, involves a review of facts and a statement of leading differences, with the causes of these differences. Thus, as the study of geography advances, each new section becomes more and more a review of previous study, as it properly should be. By the plan of this series, the third volume, devoted to Europe and the other continents, will provide for a continual review of the United States.

Study by States. — The common method of presenting the geography of the United States is to use the state as the unit. The reasons for this, aside from an appeal to state pride, are not clear. Boundary lines between states are for the most part arbitrary; they mark no important differences in physiography, industry, or custom; but, on the contrary, adjoining parts of two states, as, for instance, the adjoining parts of New Jersey and New York, near New York City, may be much more closely related than different parts of a single state.

Partly for this reason the authors have set aside the state as the unit of study. But there are other important reasons for taking this step. When the geography of the United States is studied by states, there is much repetition of the same kind of facts. For example, mining, farming by irrigation, and grazing are common to all the Western States; and when these industries are named separately for each state, a large amount of space is taken up with a minimum advance in the thought. More than this, the pupil is oppressed and confused by the great number of

individual facts which have apparently the same rank. It is not easy for even an adult to escape a feeling of confusion on reading a few pages from any modern geography which treats the subject by states.

In order to avoid such waste of space and lack of perspective among the facts, the authors have proceeded by *groups of states*, rather than by individual states. Thus farming by irrigation is only one topic, and only once treated, for the entire western division of states. Several pages are devoted to a discussion of the subject, including the manner in which irrigation is planned, its influence on the value of land, the localities most noted for irrigation, and the cities in the different states that are largely indebted to it for their growth. These many details are associated as parts of one story. It is believed that by this means the children's minds will be led to dwell long enough upon one topic to insure interest in the topic and at the same time to gain accurate impressions of both general principles and details.

However, inasmuch as geographic facts are often called for by states, a study by states is provided for. At the close of each chapter there are two sets of questions, one of which closely follows the order of the text, while the other reviews the same facts by states.

SUMMARY. — Contrary to the usual custom, the broad, general principles about industries, distribution of inhabitants, mutual relation of city and country, and dependence of various sections upon one another are included in the closing chapter of this volume. One reason for this change is that these large facts approach abstractions in their nature, and are, consequently, too difficult to be

earlier appreciated by children. They are, moreover, to a large extent, a summary of what has preceded, and, therefore, naturally come last. In the same way, a broad study and summary of the world, particularly in its relation to North America, will close the third volume.

Political Maps. — Since it is necessary to represent more places and present more details, the political maps in this volume are for the most part larger than in the First Book. They are, however, of the same quality, and, like those of the First Book, were made by the Matthews-Northrup Company of Buffalo. An important feature is the grading of cities according to population, the larger the city the more important the type used. The principal features of relief are placed upon the map, though without interfering with the clearness of the political features. In the color arrangement care has been used to gain an artistic effect, and at the same time to preserve the distinctness necessary in such maps.

No attempt has been made to preserve the same scale for the different maps. Some books claim to do this, and their authors point to the fact as noteworthy. The authors of this series have deliberately declined to make such an attempt for several reasons. In the first place, it is impossible. There must be maps of the World, of North America, of the United States, of a part of the great West, and of New England. Even in those books which point to their uniformity of scale as a merit, maps of five or ten different scales are in use.

The claim for uniformity of scale has no real foundation; but, if it had, the effect would be undesirable. One of the objects of the study of geography is to teach the

meaning and use of maps. To do this one of the first and most fundamental points is to teach the pupil to understand the meaning and importance of the system of proportion, or of "scale." In one book are maps of various scales; in the first atlas, or the first wall map which the pupil sees, there are still different scales. The pupils must be prepared to expect and to understand these differences, and it is the teacher's duty to see that they are so prepared. By the insertion of Pennsylvania as a key, and by some of our map questions we have attempted to aid in this training of the sense of proportion.

OTHER ILLUSTRATIONS. — Besides the relief indicated on the political maps, there are individual relief maps, made specially for this series by Mr. E. E. Howell of Washington. The relief maps of the continents, of which but one is included in this volume, are pronounced by experts to be the best thus far made.

The city maps are intended to serve to illustrate the surroundings which determine the growth of a large city, including, of course, the transportation facilities by water and by rail. Attention is also called to the maps showing the distribution of important industries and the diagrams accompanying them. These are all placed in the summary, with which they are most closely related; but the teacher will, naturally, find occasion to use them and refer to them in connection with the study of the earlier sections.

As in the preceding volume, the illustrations have been chosen not as pictures, but as illustrations. Usually they have been made from photographs of actual scenes. Photographs carry more weight since they are of necessity

true, while drawings leave opportunity for the exercise of the fancy, and are oftentimes incorrect. In some cases no photograph could be found to illustrate the point needing illustration. For instance, the animal pictures were drawn by the Matthews-Northrup Company, and a number of other illustrations by Mr. C. W. Furlong of Cornell University.

ACKNOWLEDGMENTS.—While valuable suggestion and assistance have been received from many sources, the authors are again constrained to acknowledge particularly the aid received from Mr. Philip Emerson of the Cobbet School, Lynn, Massachusetts. The lists of books and the table of statistics have for the most part been prepared by Mr. R. H. Whitbeck of Cornell University, who has also rendered other valuable assistance.

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Part I

A GENERAL STUDY OF NORTH AMERICA

I. PHYSIOGRAPHY OF NORTH AMERICA

The Growth of the Continent. — There are about one hundred million persons in North America at the present time, although a century ago there were scarcely one-tenth of that number. This wonderful growth has been largely due to the useful and valuable mineral products of the earth; to the soil and climate which have allowed many different kinds of plants and animals to thrive; and to the rivers, waterfalls, lakes, and harbors which have made manufacturing and shipping easy.

As it takes time to build a house, and to prepare the boards from trees, the nails from iron ore, and the bricks from clay, so it takes time for the formation of minerals and rocks and for the building of a continent. In fact, millions of years have been required for that work.

The story telling how North America was made is a very interesting one. It has been discovered by a careful study of the rocks; and although there are many questions that no man is yet able to answer, we are prepared to tell a part of the story.

At one time the earth was probably a white-hot sphere like the sun; but in time the outside cooled to a crust of solid rock. The interior, still heated, continued to shrink and grow smaller, as most substances do when cooling. This caused the solid crust to settle and wrinkle, much as the skin of an apple does when the fruit is drying. Water collected in the depressions forming the oceans, while between them, where the elevation of the earth's crust was greatest, rocks appeared above the sea-level. Thus North America and the other continents were born.

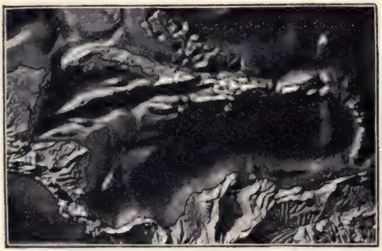


FIG. 1.

A small picture of the West Indian region as it would appear if the ocean water were removed. Notice that the islands rest on a lofty ridge rising from the ocean bottom.

In its babyhood, although the centre of the continent was still a broad sea, the eastern and western parts doubtless resembled the West Indies of to-day, which you will find on the map of North America (Fig. 95, opposite p. 120). Those islands are the highest parts of mountains arranged in a chain. They *seem* to be separated only because the ridges upon which they rest do not rise high enough to reach above the water (Fig. 1).

Although in early times North America consisted of mountain crests forming chains of islands, finally, after many changes, the mountains rose higher, forming a continuous range in the east, and other ranges in the west. Then the plains between the mountains slowly emerged from the ocean, and a large part of the continent came into view.

The Coal Period. — Ages after the beginning, a period arrived when in the northern part of North America it was much warmer than now, and the rains were far heavier. During that period our *coal* was made out of plants. There is good proof that the coal used in our stoves and furnaces is composed of plant remains. Beneath the coal beds, in the rock which was once soil, roots of plants may still be seen, while stems of plants, and even trunks of trees changed to coal, reach up into the coal beds. Also a careful examination with the microscope, or at times even with the naked eye, shows that coal is composed of bits of plants closely pressed together. Frequently the full form of a fern or leaf may be seen (Fig. 2).

FIG. 2.

Rock containing a fossil fern which grew in the swamps of the coal period.

As the crust of the earth shrinks and wrinkles, the land is raised and lowered. Even now it is slowly moving in some places, and was doing the same during the coal period. At that time some of the old sea-bottom was raised above the water, forming extensive plains in the eastern part of North America. Plants had long been growing; and these plains were so low and level that vast swamps were produced (Fig. 3), on which the vegetation was extremely rank, like a tropical jungle. After the swamp plants had grown for hundreds of years, the plains sank beneath the sea, and the vegetation became covered with layers of sand, gravel, and mud, which have since hardened into rock.

After another long period the sea-bottom emerged once more, and the dense swamp vegetation returned; but this time the plants grew with their roots in the ocean mud which had buried the earlier swamp. After many more years the plains again sank, and the swamp vegetation was buried as before. This rising and sinking of the land continued for ages, one set of layers of rock, soil, and vegetation being covered up by another, until many such sets were formed.

FIG. 3.

The way the coal swamps appeared, so far as we can tell from the fossils which have been preserved.

Though the swamps were, no doubt, somewhat similar to those which may now be seen in many places, the vegetation grew far more thickly, perhaps even more thickly than in the jungles of India or the everglades of Florida. Also the plants were so different from those of the present, that not a single species now living grew in the coal swamps.

When the plants died they fell into the water, making a woody matting which did not fully decay, because the water prevented air from reaching it. If it had been dug up and dried, it might have made good fuel. Indeed, it is now the custom in Ireland, Norway, and some other cool, moist lands to dig such matter out of the swamps and dry it, forming *peat*, a fuel used for cooking and heating.

Some of the poorer coals of the West, known as *lignite*, are little more than peat beds partly changed to mineral coal. Other coal, called *anthracite*, found especially in the mountains of Pennsylvania, has been changed so greatly that it is as hard

as some rocks, and is known as *hard* coal. But most of the coal that is mined, — as that of western Pennsylvania and the Central States, — although quite like a mineral, and harder than lignite, is not so hard as anthracite. This is called *soft* or *bituminous* coal.

The woody matting that gathered in some of the swamps grew to be scores of feet in thickness; but, on being covered up, it was pressed more tightly together. As the number of layers above increased, causing the pressure to become very great, it gradually changed into coal, making coal beds that are often from six to twelve feet in thickness.

Fig. 4.

A view in the Dismal Swamp of Virginia. Compare Fig. 3 with this to see how different the trees are.

All this time, and at other periods during the formation of the continent, iron, copper, gold, silver, building stones, and other materials that we need every day, were also being slowly formed in the rocks; but we cannot now tell their story.

The Mountains and Plateaus. — During the millions of years that the continent was growing to its present form, there were rising, in the East and West, mountain systems and surrounding plateaus that were to have a great influence upon our climate, and therefore upon our crops, our animals, and ourselves. Being very old and much

worn down, the eastern mountains, called the *Appalachians*, are neither very high nor very rugged, though they have some peaks which reach more than a mile above sea level. The western *Cordilleras*, being younger and therefore less worn, are more rugged, and have peaks rising three miles and more above sea level. At the base of the Appalachians is a narrow plateau rarely more than fourteen hundred feet high; but the Cordilleras tower above a broad plateau which is itself more than a mile in height, or as high as the mountain peaks of the east.

Many of the rocks of the mountains and plateaus were deposited as sediment in the sea and afterward raised to their present position by the movements of the earth's crust. In spite of their great elevation, the plateaus have remained level because the rock layers, or *strata*, of which they are made, were kept in a horizontal or level position while being uplifted. This can be seen where rivers have cut deep channels in the earth, showing the layers of rock to be nearly as level as when they were a part of the ocean floor (Fig. 6).

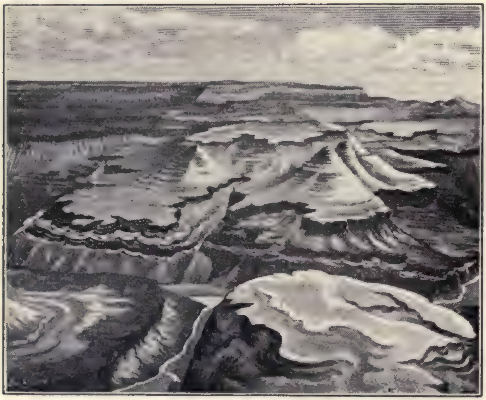
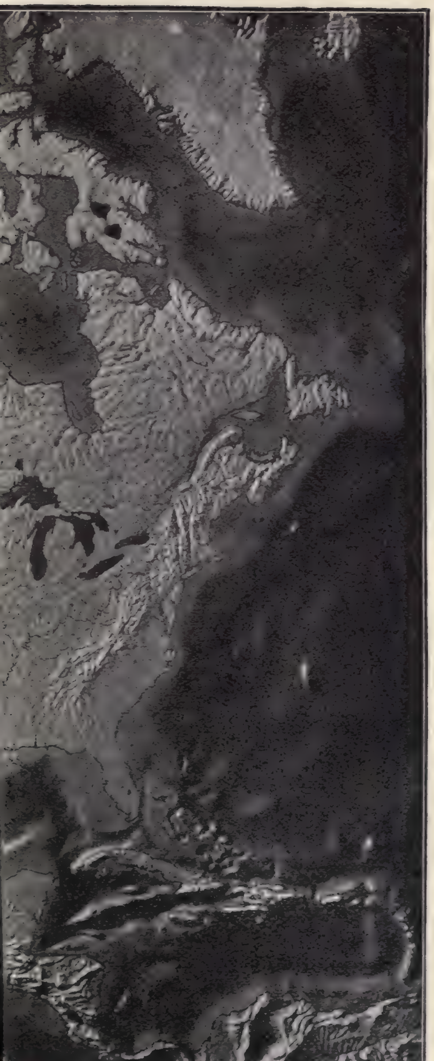


FIG. 6.

This valley, known as the Colorado Canyon, has been cut to a depth of over a mile in the rock strata of the Colorado plateau. Can you see the horizontal strata?

FIG. 5.
Relief map of North America.



a.

On the other hand, the wrinkling of the earth's crust has in some places broken and folded the rock layers, and formed lofty mountain ranges in which the strata have been tilted and upturned, instead of remaining level (Fig. 7).

Fig. 7.

Tilted layers in the Rocky Mountains of Colorado. They were deposited as horizontal beds in the sea, as those of the Colorado plateau were (Fig. 6); but, during the mountain folding, they have been turned up on end, and then worn away and carved into irregular hills by the rains.

A part of the height of mountains is due to the fact that they rest upon a platform of tablelands about them. Therefore a mountain crest two miles above sea level *may* really rise less than a mile above the plateau at its base.

Mountains are not nearly so high as they would be if they had not been attacked for ages by the weather and the rivers. Not only have they been *lowered* by these means, but also greatly carved and sculptured, being cut into ridges and peaks, and crossed by deep canyons which the rivers have dug out.

After mountains have ceased rising, their peaks are lowered, and their valleys broadened, until they lose much of their mountain character, as in the case of the Appalachians. Indeed, they may even be reduced to a series of low hills, as in southern New England, which is really an ancient mountain region now worn down to its very roots.

The folding, breaking, and sculpturing of the mountain rocks have had an important effect upon mining. As you see from

Figure 8, these changes often bring to view valuable minerals which were formed ages ago and are now deeply buried in the strata.

Some mineral deposits, like coal, were laid down in beds between other layers of rock (p. 4); but many valuable minerals, such as gold, silver, and copper ores, were deposited in cracks of the mountain rock, forming *veins*. Into these cracks

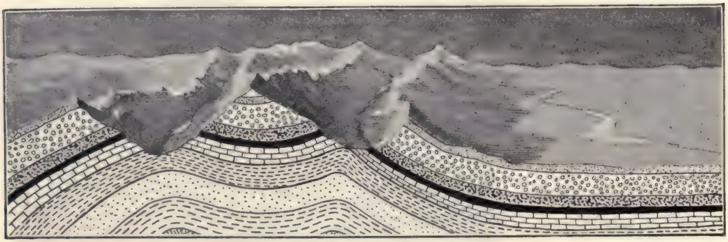


FIG. 8.

A section in the earth, where the rocks are folded, to show how a bed of valuable mineral, such as the black layer, may be brought to light by folding and river cutting, while elsewhere it is deeply buried.

hot water, often heated by deeply buried masses of lava, has brought valuable metals and deposited them in veins. Iron ore also has been deposited by water in beds and veins, though not always by hot water.

Volcanoes. — Hundreds of mountain peaks in the West, instead of being made in the manner just described, are *volcanoes*. These are built of molten rock forced to the surface from within the earth. Though no longer active, these peaks are *known* to be volcanoes because of their cone shape, the hollows or *craters* in their tops, and the lava and volcanic ash, or blown-up lava, of which they are made.

Doubtless some of these volcanoes have recently erupted; indeed, one, Mt. St. Helens in Washington, is reported to have

been in eruption about a half century ago. Another, near Mt. Shasta in California, poured forth lava a very short time ago. This is known because the lava flow dammed up a stream, forming a lake whose waters rose into the surrounding forest, and killed the trees; but the trees still stand in the lake, not having had time to decay.

Hundreds of thousands of square miles of this western country are covered by lava flows. The soil produced by decay of the lava is often extremely fertile, and that is one of the chief reasons why the central part of the state of Washington, which is largely covered with it, has become noted for its fruit and wheat. There the lava flowed out from great cracks or

FIG. 9.

Mt. Shasta, California, one of the great volcanic cones of the West, 14,380 feet high, and made entirely of lava and volcanic ash. A smaller cone is seen on the right.

fissures and flooded immense areas of country. The area of the lava flows in the Columbia and Snake river valleys is more than twenty-five times as great as that of Massachusetts.

The Trough between the Two Mountain Systems. — From the mountain systems of the East and West, the land slopes gently toward the Mississippi River, which flows in the trough made by the uplift of the two sides of

the continent. Measure the width of this trough on the map of the United States (Fig. 98, p. 123).

This extensive lowland has had a long history, like the mountains. In the early ages so much of it was under water that a great sea extended from where the Gulf of Mexico now lies to the Arctic Ocean. In the rock layers are found many remains, or *fossils*, of shells, corals, and fish that lived in the sea of this ancient time. Upon dying

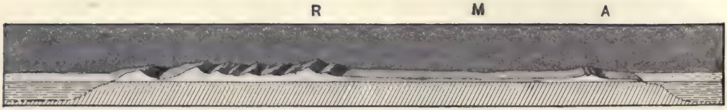


Fig. 10.

Section across the United States, to show the two highlands and the great trough between. A, Appalachians; M, Mississippi; R, Rocky Mountains.

and dropping to the bottom, these animals were entombed in the beds which have since been hardened to rock.

After a time most of this sea bottom was raised to form dry land, although a part of it — from the Gulf of Mexico to southern Illinois — remained under water for a long time afterward. Into this sea the Mississippi discharged its floods and dropped its load of soil, swept from the distant fields and mountains. As time went on, the river filled up the sea and formed flood plains, which — raised by a slight uplift — are among the most fertile lands of our country. And now the river seems bent on filling up the Gulf itself.

Although the mountains and plateaus of our country are so far away from the lowlands, they have a great influence upon them. The Mississippi Valley, in all but its southern part, is in a belt of the earth where most of the winds blow from the west. Since these winds blow from

the Pacific Ocean, they are at first damp; but upon reaching the western highlands, they are compelled to drop much of their moisture, and then they pass on into the Mississippi Valley as dry winds. This causes the plains and plateaus of the northwest to be dry or *arid.* The eastern and southern portions of the valley have a more humid climate. The reasons for this are that this region is so near the Gulf and the Atlantic, and is separated from the latter by such low mountains, that damp ocean winds are able to reach it.

In spite of the fact that most of the West is arid, many rivers have their sources among the high mountains. Notice, for instance, how many tributaries of the Mississippi rise among the mountain ranges (Map, Fig. 97, opposite p. 122). This water carries sediment for hundreds of miles, building it into flood plains and deltas. From this it is evident that the highlands not only supply the Mississippi with much of its water, but also with some of the soil which has made such fertile farm land.

The direction in which the ranges extend is a matter of great importance, also. Since the mountains run north and south, the warm south winds find no highlands to check their northward course. Therefore, they are able to carry warmth and moisture a great distance, even far into the northern part of the United States. In consequence, the Mississippi Valley is one of the largest and finest farming sections in the world, producing a great variety of crops. Where the summers are shortest, though still warm, excellent wheat is raised; farther south, corn is the principal crop; and in the southern part, where the summers are longest and hottest, tobacco, cotton, sugar-cane, and rice are grown.

How different it would be if a great mountain system extended east and west across the continent! The warm sum-

mer winds could not, then, carry their warmth and moisture so far north; neither could the north winds, which are cool in summer and cold in winter, reach so far south. The north winds are very important; they moderate the heat of summer and bring cool weather in winter. Sometimes they do damage in winter by causing destructive frosts, even as far south as Florida. Then the orange and lemon trees suffer greatly. But they also do good, for too much heat takes away the vigor of the people, while cool air makes them more active.

The Great Ice Age. — Long after the coal beds were formed and the great highlands and valleys were built,

FIG. 11.

A picture of the Cornell glacier in Greenland. It is a great waste of ice, slowly moving down from the interior to the coast and ending in the sea, where icebergs break off and float away. One of these may be seen in the picture (see also Fig. 12).

another very important event happened in the preparation of this continent for our home. That was the formation of a great *ice sheet*, or *glacier*, which covered a large part of northern North America. This glacier had much to do with making the lakes, waterfalls, and even the soil itself, in that section.

An ice sheet similar to that one may still be seen in Greenland (Figs. 11 and 14). Excepting along the very coast, this immense island is buried beneath a sheet of ice which has an area about ten times as great as that of New York State.

The Greenland glacier is made of snow which has fallen on the high interior in such immense quantities that the pressure upon the under part has changed it to ice, as pressure from your hands will change a snowball to ice. As the snow collects and becomes ice, it spreads out, or *flows*, from the interior toward the coast, much as a piece of wax may be made to flow if a weight is placed upon it. Moving toward the sea, the glacier drags away the soil, tears off fragments of the rock, and scours the rock layers, as if it were a great sand paper. The movement is very slow, yet the ice is always pushing onward to the sea, where enormous *icebergs* are continually breaking off and floating away (Figs. 11 and 12).

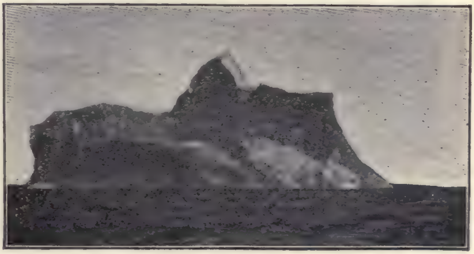


FIG. 12.

An iceberg from the Greenland glacier, slowly floating southward, where it gradually melts away in the warmer water and air.

The glacier which formerly extended over a part of this continent was likewise made of snow. It covered most of northeastern America, reaching as far south as New York City and the Ohio River, but not so far south in the northwest (Fig. 13). Being over a mile deep in its thickest part, and in consequence very heavy, the glacier swept away the soil which had previously been

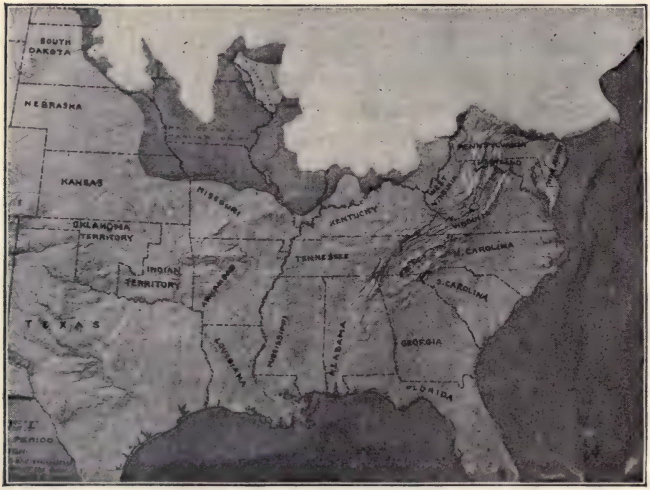


FIG. 13.

Model showing the distance which the Great Ice Sheet reached in United States. (Model made by E. E. Howell, Washington, D.C.)

made. Not only this, but, by the help of rock fragments held fast in its bottom, it scraped off pieces of the solid rock and carried them forward also.

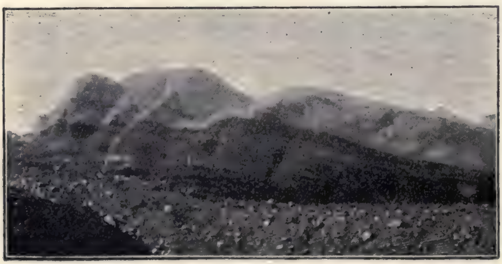


FIG. 14.

The ice front of a part of Cornell glacier (Fig. 11), with moraine at its base, where rock fragments fall from the melting glacier. The dark lower part of the glacier is filled with pieces of rock.

Although the glacier was always pushing southward into our country, its southern end was continually melting away, owing to the warmer climate

which it met. At times the movement was just rapid enough to supply the waste due to this melting, so that the edge remained in nearly the same position for years. All this time the sand, gravel, and rock, which had been carried along in the ice, were being piled up along the line where the glacier melted, forming a great mass called a *moraine* (Figs. 14 and 15). The moraine hills, or hummocks, of gravel and clay were often built to a height of one or two hundred feet.

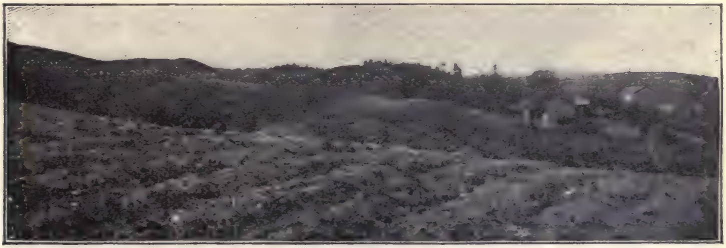


FIG. 15.

Some hummocks in a moraine formed by the Great Glacier near Ithaca, N.Y.

After standing for a while and building a moraine in one place, the glacier front often advanced to the south, or melted away toward the north, building up other irregular piles of moraine hummocks.

During the thousands of years that the glacier lasted, it carried millions of tons of clay and rock from one place to another and built many low hills. As it slipped over the surface, it ground boulders and pebbles together and rubbed them against the solid rock, scratching and grooving it (Fig. 16). Scratches thus made may still be seen pointing northward, toward the place from which the glacier moved. This work of rasping, digging, carrying, and dumping done by the glacier has led to its being called a combined file, plough, and dump cart of immense size.

Finally, after thousands of years, the great ice sheet melted away. No one is able to say why it came or why it went away; but that it *was here* and did the work described, all who have studied the subject are fully convinced.

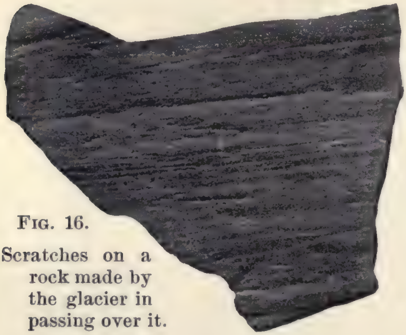


FIG. 16.
Scratches on a rock made by the glacier in passing over it.

It was the glacier which caused the great number of lakes in the northeastern part of North America. Minnesota alone is said to have ten thousand, and in New England there are also thousands (Fig. 17 and Fig. 100, p. 124); but most of the states outside of the glacial region have extremely few.

The manner in which these lakes were formed is as follows: The load of clay and boulders, or *drift*, as it is called, was dumped irregularly over the land. It sometimes filled in valleys and built up dams, behind which ponds and lakes collected. The glacier also formed lake basins by digging, or ploughing, directly into the rock. Even the Great Lakes did not exist before the glacier came; their basins occupy broad river valleys which have been blocked by dams of drift and deepened by the ploughing of the Great Ice Sheet.

The glacier also had an important influence upon our manufacturing. Its load of rock fragments often filled parts of valleys so that, after the ice was gone, the streams were compelled to seek new courses. These courses often lay down steep slopes or across buried ledges, over which the water tumbled in a succession of rapids and falls.

Even the great cataract of Niagara was caused in this way, and the same is true of many of the falls and rapids of hilly New England and New York. The many lakes act as storehouses to keep the noisy falls and rapids well supplied with water. For these reasons New England and New York have such abundant water-power that they early grew to be the greatest manufacturing centres of the Union. In sections of the country not reached by the glacier, rapids and falls are much less common. Did the glacier reach where you live?

FIG. 17.

A New England lake formed by a dam of drift left by the glacier. It is very irregular because the water behind the dam has risen into many valleys, leaving only the hilltops above the surface.

A third important influence of the glacier was upon the soil. In most other parts of the country the soil has been made by the *decay* of rock (see First Book, p. 2); but in the glacial region the decayed rock was swept away and replaced by drift brought by the glacier. This was made by the grinding of rocks together, much as flour is made by grinding wheat; in fact, glacial soil is sometimes called *rock flour*. As the glacier scraped along, it ground an

enormous quantity of rock to bits, so that when it melted, a layer of drift (Fig. 18) was left, in some places reaching a depth of several hundred feet. Most of the clays from which bricks are made in the North were also brought by the glacier.

Fig. 18.
Glacial soil resting on the bed rock in Central New York.

With the melting of the glacier, much water was produced. This washed out and carried off a great deal of clay, in some places leaving extensive sand and gravel plains, where the soil is not very fertile. Many of the cities of New England are built upon these level sand plains. Into the sand beds the rain water readily soaks, and then slowly oozes out, thus keeping the streams supplied with water. This makes the sand plains great reservoirs of water, much as lakes are.

Fig. 19.
A field on Cape Ann, Mass., where the glacier left many large boulders.

The bits of ground-up rock left by the glacier have an important effect upon the soil. Since these fragments were gathered up from many places, and from many different kinds of rock, they sometimes cause a fertile soil in places where the decay

of the rocks would have naturally caused a sterile soil. The constant rusting or decaying of these rock fragments supplies the soil with plant food; and for this reason the glacial soils are usually fertile year after year. But, on the other hand, in some places the glacier failed to grind the rock into tiny bits, leaving pebbles and even large boulders to cover the ground and prove a great nuisance to the farmer (Fig. 19).

The Coast Line. — In studying about the Mississippi Valley and the formation of coal, we have seen that the land and sea bottom are not fixed, but that they often slowly rise or sink.

Such changes in the land level are even now in progress in many places, though so slowly that it requires years, and even centuries, to notice them. For instance, along the coast of New Jersey the land is sinking at the rate of about two feet a century, while the land around Hudson Bay is rising.

Some of the recent changes in the level of the land have had an important effect upon the coast line. For example, the reason we find so many islands and peninsulas along the northeastern coast (Fig. 95) is that this section has been lowered several hundred feet. By this means the ocean water has been allowed to enter the valleys, while the higher land between them extends above the water in the form of peninsulas, capes, and islands.

The peninsulas of Labrador and Nova Scotia, and the hundreds of islands along the northeastern coast, including Newfoundland, owe their existence to this sinking. The irregular Pacific coast from Puget Sound northward (Fig. 20) was produced in the same way.

By this sinking of the land many good harbors were made, the best ones being where rivers enter the sea.

When the land was higher, the streams carved out broad valleys, into which, when the land sank, the sea water entered, forming bays and harbors. That is the way the Gulf of St. Lawrence was formed ; also New York, Delaware, Chesapeake, and San Francisco bays, as well as the many excellent harbors of the East. What rivers carved out the bays mentioned? (See maps, Figs. 95, 97, and 121.)

One reason for so few good harbors along the coast of the Southern States is that the land in this section has been *rising* out of the sea. Just off the coast is a broad

FIG. 20.

A picture of the irregular coast of Southern Alaska, near Sitka, where the sinking of the land has drowned the valleys, leaving only the hilltops projecting above the sea.

ocean-bottom plain where the water is shallow (Figs. 96, 122, and 154), while still farther out, the bottom slopes rapidly and the ocean becomes very deep. Upon this sea-bottom plain, called the *continental shelf*, layers of rock bits, or *sediment*, are being deposited, much as layers of rock were formed on the sea bottom during the coal period. If the continental shelf should be raised it would form a great level plain.

That part of the Southern States which borders the Gulf and the ocean was once a portion of this ocean-bottom

plain; but it has been raised until it is now a low, level plain (Fig. 21). Since the continental shelf is so level, when a part of it was lifted above the water there were few places for deep inlets, bays, and harbors. After being raised, the coast was slightly lowered; but the bays thus formed are shallow and the harbors poor.

FIG. 21.

A part of the raised sea bottom which forms the level plain of Florida.

The level plain of the Florida peninsula is also a sea bottom that has been lifted above the ocean. Many of the lakes and swamps which abound in that region are believed to be due to the shallow basins built by the irregular deposit of sediment on the old sea floor.

Size, Shape, and Position. — North America is third in size among the six continents of the earth. By reference to page 445, find which are larger and which smaller.

After being changed in shape during millions of years, owing to the rising and sinking of the land, it at present has the form of a triangle with the broadest portion in the north. Draw the triangle. Compare its shape with that of South America and Africa (Fig. 359). The northern part is so wide that Alaska extends to within fifty miles of Asia; but Labrador is over two thousand miles away from Europe. The distance from Alaska to Asia is so short that the early ancestors of our Indians and Eskimos probably first reached North America by crossing over from

Asia. On account of the greater distance across the Atlantic, for a long time Europeans did not know that North America existed; but it is certain that the Norsemen from Norway visited our shores nearly five hundred years before Columbus discovered the continent.

Those portions of North America which are nearest to Asia and Europe are so cold that few people live there. Farther south, where most of the inhabitants live, the continents are spread farther apart, as you will see by examining a globe. The broad Atlantic must be crossed in passing from Europe to America; this fact helps to explain why the Spanish colonies were able to win their independence from Spain, and the United States from England. The distance across the sea was too great to send large armies and supplies for them.

This separation of Europe from America has also helped in the development of our industries. At first, the colonists brought even bricks, doors, and timber from Europe; but although the ocean is an excellent highway, it is expensive to send goods such long distances. Therefore the settlers soon learned to raise and make most of the articles that they needed for food, clothing, and shelter.

Nevertheless, the ocean is such an excellent highway that ships are able to sail across it in every direction and bring what we really need, or carry back such products as cotton and tobacco, which Europeans desire. Ships have also brought to us the hundreds of thousands of English, Irish, Germans, French, Swedes, and others who have settled and developed our country, and whose descendants are its citizens. Since Europe is our *mother land*, it has been, and is still, very important to keep in close touch with the various nations of that continent. This has been made

possible partly by the shortness of the journey, now that vessels are moved by steam, and partly by the excellent harbors caused by the sinking of our coast.

The Pacific Ocean is much wider than the Atlantic (see a globe), and therefore much more difficult to cross. Although the shores of Asia which face North America are densely settled, until recently we have not needed to have much commerce with the inhabitants of that continent because they were not very progressive. Now, however, the Japanese have adopted the methods of modern civilization, and we have come into control of the Philippine Islands, so that many of our ships cross the Pacific.

South America is also easily reached by water, and there is much trade with the various countries of that continent. Although South America is joined to North America by the narrow Isthmus of Panama, there is at present no railway connecting the two continents, though one is being planned. This isthmus is a great barrier to ocean commerce between eastern and western United States and between the Eastern States and Asia. It is very narrow, and in places only two or three hundred feet high; yet, because it is there, ships must travel thousands of miles around South America. A railway crosses it, and ship canals, one across the isthmus and another farther north, are planned. Of what advantage will these be?

Relation of Man to Earth.— So we see that our continent, as we know it, has not been here from the beginning; instead of that, millions of years have been required to prepare it for us. Ocean bottoms have been lifted into mountains, plateaus, and valleys; coal beds, building stones, and valuable minerals have been formed; a mighty glacier has swept over the country, grinding rock into powder and causing lakes, water-routes, falls, and rapids; and the coast has been sinking here and rising there, producing fine harbors in some places and greatly increasing the

extent of the plains in others. Our very position, separated by the ocean from the Old World, and yet enabling us to reach it when it is necessary, is an advantage.

But our comfort and prosperity do not depend upon the land alone: the *sun*, the *air*, and the *ocean* are also of great value to us. The sun supplies our *heat;* but it is warmer in *summer* than it is in *winter*. The air, which envelops the earth, is heated by the sun's rays, and moves about, forming *winds*. These bring us vapor from the ocean, and this vapor falls to the earth in the form of *rain* and *snow*. The water of the ocean not only furnishes vapor for rain; it is also disturbed by *waves* and *tides* which do important work along the coast, and by warm and cold *currents*, which affect the climate even hundreds of miles away. All these matters need to be studied before we can fully appreciate how beautifully the world is adapted to our needs.

Review Questions. — (1) What was the condition of North America in early times? (2) What is coal made from? Tell how it was formed. (3) What proofs are there of this formation? (4) What is peat? (5) Name and locate our two chief mountain systems. (6) How high are the plateaus at the base of each? (7) Explain why the plateaus are so level in spite of their height. (8) How have the mountains been made? (9) Explain what effect this has had upon mining. (10) Tell about the volcanoes of the West.

(11) Why is the Mississippi Valley called a trough? (12) What was its condition in early times? (13) How was the interior sea finally changed to dry land? (14) Mention some ways in which the mountains control the Mississippi Valley. (15) What differences would follow if the ranges extended east and west?

(16) Describe the Greenland glacier. (17) How far did the great American ice sheet reach? How deep was it? (18) What are moraines? (19) What do the scratches on the rocks tell us about the glacier? (20) Why is a glacier compared to a plough? A file? A dump cart? (21) In what ways did the glacier cause lakes?

(22) Falls and rapids? (23) Soil? (24) What effect has the glacial soil upon farming? (25) Tell the whole story of the glacier.

(26) Why are there so many islands, peninsulas, bays, and harbors in the northeast? (27) Name some of them. (28) How have some of our largest bays been made? Name them. (29) Why are there so few harbors on our southern coast? (30) What is the cause of the southern plains? (31) What is the continental shelf? (32) How does North America compare in size with the other continents? (33) How far is the mainland from Asia and Europe? (34) Show how our position is a favorable one. (35) What is the influence of the Isthmus of Panama?

SUGGESTIONS. — (1) Make a collection of different kinds of coal. (2) Examine some pieces of soft coal closely to see if you can discover plant remains. (3) Obtain some peat. (4) Learn what you can about coal mining. (5) What is the elevation of the land at your home? (6) Examine layers of rock in your neighborhood to see if they are horizontal or tilted. See if they contain fossils. (7) Make a drawing similar to Figure 10. (8) Why are volcanoes shaped like a cone? Why is there a crater in the middle? (9) Make a model of a volcano out of sand or clay. (10) What becomes of the Greenland icebergs? (11) Make a map showing the extent of the American glacier. (12) What signs of the glacier, if any, can you find in your neighborhood? (13) Examine the clay in a brickyard. (14) Pound a pebble to bits and plant beans in it to see if they will grow as well in that as in soil. (15) Name several great cities that have grown up about our Northern harbors. Name some in the South. (16) Draw an outline map of the northeastern coast, and another of the southern coast, to see how they differ. (17) Collect pictures of volcanoes, glaciers, mountains, and plateaus. (18) With the aid of sand in a basin make a model of an irregular land, then pour in water to show how it enters to form bays, islands, etc. (19) How many days long is the voyage, on a fast steamer, from New York to Liverpool? How many miles an hour does the steamer go? How many miles does that make the distance? (20) How long is the journey from San Francisco to Manila? (21) From New York to Manila by going eastward? Through what waters would one pass on such a voyage? (22) What would be the distance from New York to Manila by sailing around South America? How much shorter would it be if the ship could go through a canal across the isthmus?

FOR REFERENCES TO BOOKS AND ARTICLES, see page 438.

II. SUMMER AND WINTER

The Sun and its Position. — The earth is a planet, one of the members of the solar system, all of which revolve around the great central body, the sun. Although millions of miles away, the sun supplies us with light and heat, for it is a glowing hot sphere over a million times as large as the earth (Fig. 22). The rays from the sun pass outward in all directions, and some of them fall upon the earth (Fig. 23), causing the light and heat which are of so much importance to us.

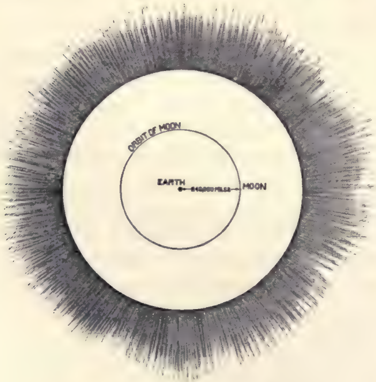


FIG. 22.

Relative size of earth and sun. This shows how very large the sun is. Notice that the distance from the centre of the sun to its outside is much greater than the distance from the earth to the moon, which is 240,000 miles from us.

Light and heat vary greatly in different places. If we could spend a summer north of the Arctic Circle with the Eskimos (Fig. 24), we would find weeks of constant day,[1] and be able to see at midnight as well as at midday. The sun reaches the highest point on the longest day, June 21st, but it is even then low in the heavens (Fig. 32). Day

[1] Exactly at the north pole there are six months of day and six months of night.

after day it circles around the heavens near the horizon, coming nearer the horizon at night than during the day.

Later in the summer, the sun begins to set and the days to grow rapidly shorter. Finally the sun disappears, even at noon, though for several weeks there is twilight in the middle of the day. Soon, however, there is no twilight, and darkness prevails throughout the whole twenty-four hours, accompanied by bitter cold.

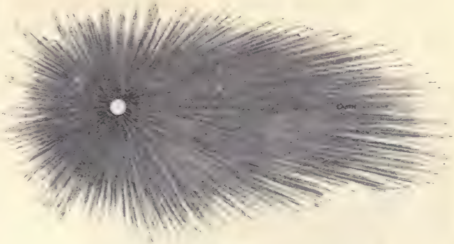


FIG. 23.

Notice that of all the rays passing outward from the sun only a very small part reach the earth, the rest passing off into space.

During the winter night the stars and moon furnish a dim light by the aid of which the Eskimos are able to hunt the seal and polar bear which supply them with food. On these hunts they dress in warm furs and travel over the frozen sea on sledges drawn by wolf-like dogs.

FIG. 24.

Some of the Eskimos whose homes are in the frigid north. The mothers carry the babies in fur hoods on their backs.

In the south frigid zone, the same changes in the sun's position occur, though there the sun is highest on December 21st.

This causes the long summer day to come there while the north frigid zone is wrapped in the darkness of the long winter night.

Now let us fancy ourselves in the torrid zone. There the sun reappears every morning in the year; and every noon it is almost directly overhead, while for a part of the year it is exactly overhead. No snow and ice are seen, and the climate is so warm, even during the winter, that the inhabitants wear as few clothes as possible. Indeed, some savages wear almost none (Fig. 25).

FIG. 25.

Savages whose homes are in the tropical zone. Contrast their dress with that of the Eskimos (Fig. 24).

While the noonday shadows in the north temperate and north frigid zones always fall toward the north, and in the southern zones toward the south, in the torrid zone they fall northward during one part of the year and southward during another part. Of course at the time when the sun is directly overhead they do not extend in either of these directions.

These different positions of the sun, with the resulting changes in the length of the days and in the seasons, are among the most important facts about our home, for they compel great changes in our food, clothing, and habits. What differences, from season to season, are there in the position of the sun and the length of the day where you

live? Two causes work together to produce these changes, as we shall now see.

Inclination of the Earth's Axis.—One cause for change of seasons is the position that the earth holds with reference to the sun. It is easy to see that if the earth always stood before the sun, as shown in Figure 33, page 35, the sun's rays would reach from pole to pole, lighting one half of the globe at a time and leaving the other half in darkness. As the earth made its daily rotation, all places upon it would have day and night every twenty-four hours, excepting at the very poles, where the sun would *always* be seen on the horizon.

But if the earth's axis were tipped or *inclined*, so that the north pole was always turned *toward* the sun, as in Figure 31, the conditions would be very different. Then, as the earth rotated, the sun's rays would not only reach the north pole, but extend beyond it, while they would not reach the south pole at all.

In that case, if one stayed a year in the north frigid zone, the sun would be in sight all the time, while if he stayed a year at the south pole he would not see it at any time. Since the sun furnishes heat as well as light, it would always be summer in the northern hemisphere and winter in the southern.

If the earth's axis were tipped so that the south instead of the north pole were the one always turned toward the sun (Fig. 34), the opposite condition would prevail in each hemisphere. That is, it would be perpetual night at the north pole and constant winter where we live; but perpetual summer would prevail in the south temperate zone, and the south pole would have constant sunlight.

The fact is, that *the earth's axis is always inclined*, as in the figures; but, as we well know, our summer does *not*

last all the time, nor do we have perpetual winter. We also know that both the north and south poles are in darkness a part of the year, and lighted for the remainder of the year.

Revolution of the Earth around the Sun. — This leads us to the second cause for our seasons. Although the earth's axis is *always* inclined in the same direction, the earth does *not* always remain on the same side of the sun. Therefore it does not have the same pole always turned toward the sunlight; for, in addition to its rotation, the earth has another movement, that of travelling, or *revolving*, around the sun (Fig. 27).

The sun is about ninety-three million miles from us — a distance so great that no one can fully realize it; but the earth is moving at such a tremendous rate that it completes one journey around the sun, or one *revolution*, in almost exactly 365 days, or one year. This explains how we get our year.

In its revolution the earth is moving at the rate of more than one and a half million miles per day. What speed! And at the same time it is whirling or rotating rapidly on its axis, as already explained (see First Book, p. 115).

The Attraction of Gravitation. — As in the case of the earth's rotation, one might ask (First Book, p. 116), Why are we not swept from the earth by the wind? The answer, as before, is that the air, and everything else upon the earth, is drawn toward it and held in place by the force of gravity, so that all travel together in the journey around the sun.

If the earth is revolving at such a fearful speed, why does not the earth itself fly away into space? As a stone swinging round at the end of a string flies off when the string breaks, so it might seem that the earth would fly away, since there *appears* to be nothing holding it to the sun.

But there *is* something to hold it. It is not a string nor a rope, to be sure, but something far stronger. The sun is very much larger than the earth, in fact, over a million times as large, and attracts the earth to it, as the force of gravity attracts men and houses to the earth. This *attraction of gravitation*, which the sun exerts upon the earth, is what prevents the latter from flying far off into space; it holds the earth as firmly as the string holds the stone.

FIG. 26.

Notice that the axis here is inclined in the same direction in each case, but that the light reaches different places on the apple in each of the three positions.

Effect of Inclination and Revolution. — Since the earth's axis is always inclined in one position, the revolution causes first one pole to be turned toward the sun, and then the other. You can understand how this must be if you run a needle or slender stick through an apple, as in Figure 26, and carry it around a lamp which represents the sun. In doing this be sure always to keep the stick,

which represents the earth's axis, tilted in the same direction. As you go, the part of the apple turned *toward* the lamp constantly changes. The inclination of the axis does *not* change; but, nevertheless, first one end, or pole of the stick, faces the light, then the other.

So it is with the earth; as it revolves around the sun, always with its axis inclined in the same way (Fig. 27), it is constantly reaching new places in its path of revolu-

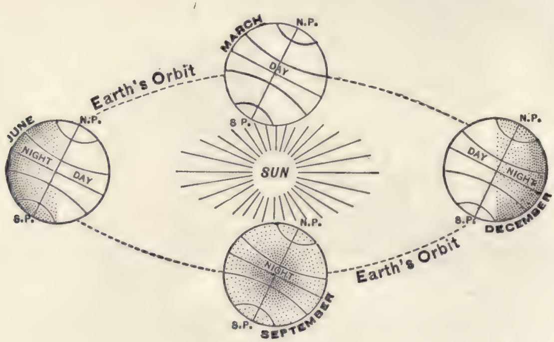


FIG. 27.

To show how the earth appears as it journeys around the sun. In order to represent this clearly, it has been necessary to make the earth appear very much larger than it really is. Compare the size of the earth and sun here with that in Figure 22, where their relative size is shown.

tion, now with the northern hemisphere facing the sun (June, Fig. 27), and the southern hemisphere turned away from it, then, later, with the conditions just reversed.

Summer and Winter.—These changes in the position of the earth with reference to the sun exert an immense influence upon the life on the globe. They cause us, whose homes are in the temperate zone, to struggle at one season to keep cool and at another to keep warm; while

for weeks, and even months at a time, they force the Eskimos to hunt their food in darkness and in the midst of the most intense cold (p. 27).

To understand why it is cold in winter, we must remember that our light and heat are received from the sun, and that it

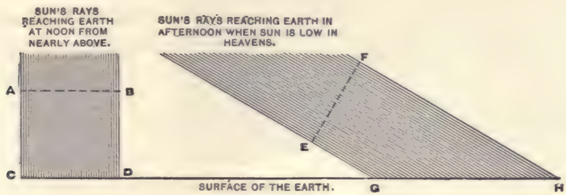


FIG. 28.

Two bundles of rays, each a half inch wide (A–B and E–F); but since one set comes from nearly overhead, while the other set comes at a slant, the first fall upon a smaller surface than the second. If you measure C–D, you will find it half as long as G–H. That is, the same number of rays coming at a slant cover twice as much ground as those from overhead.

makes a great difference how the sun's rays reach us. Morning and evening are cooler than midday chiefly because at the former time the sun's rays fall at a greater slant (Fig. 28); and for the same reason winter is colder than summer.

You have, of course, noticed that in midwinter the sun rises and sets far to the south of the true east and west, and that even at noon it is low in the heavens; but in midsummer it rises and sets much further to the north, and at noon is

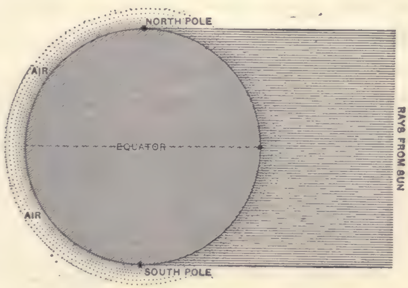


FIG. 29.

A diagram showing that the sun's rays near the poles reach the earth in a more slanting way, and after passing through more air, than at the equator.

far higher in the heavens. When the sun is so low, the rays reach the earth in a slanting way, so that fewer of them fall upon a given area of ground than when they come from nearly overhead (Fig. 28).

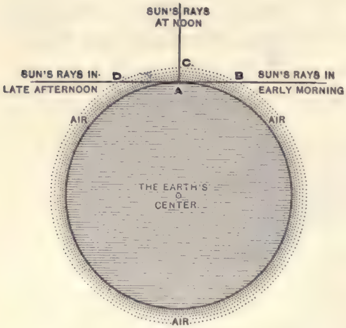


FIG. 30.

To show that the sun's rays pass through more air when the sun is low in the heavens than when it is high. Explain the figure.

There is a great deal of dust floating about in the air, as may easily be seen when a beam of sunlight enters a dark room. This interferes with the passage of the rays, much as muddy water does; hence, when the sun is low and its rays pass through a great thickness of dusty air (Fig. 30), many of them are prevented from reaching the earth. In large cities where there is much smoke, and on hazy days when there is much dust in the air, the sunlight is greatly interfered with.

The Length of Day and Night. — The northern hemisphere faces the sun most fully on the 21st of June, as shown in Fig. 31. At noon of that day the sun is directly over the heads of the people who live in Cuba, southern Mexico, and other places on the *Tropic of Cancer*.

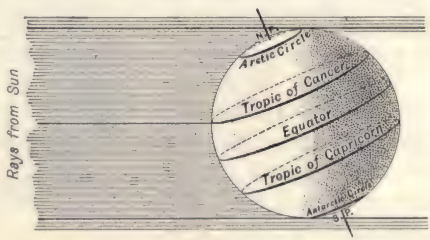


FIG. 31.

Position of the earth June 21. Notice the vertical ray (middle heavy line) over the Tropic of Cancer. The shaded portion of the ball represents night.

At that time there is sunlight throughout the entire twenty-four hours in all the region enclosed by

the *Arctic Circle.* Find this upon a globe, and note how much of Greenland and Alaska it includes.

The 21st of June, when the midnight sun shines on all parts of the north frigid zone, is our longest day; but farther south the days grow shorter until the *Antarctic Circle* is reached. There, on June 21, the sun just appears on the horizon at noon, while nearer the south pole it is dark as night throughout the entire twenty-four hours.

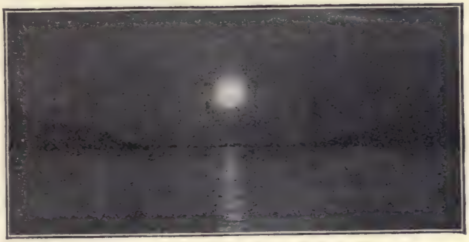


FIG. 32.

The sun at midnight of June 21, at North Cape, Norway.

After the 21st of June, the earth's further revolution causes the north pole to begin to turn away from the sun and the south pole to turn toward it. The sun then *appears* to be moving southward; but, as in the case of sunrise and sunset, we know that it is not the sun, but the earth, that is moving.

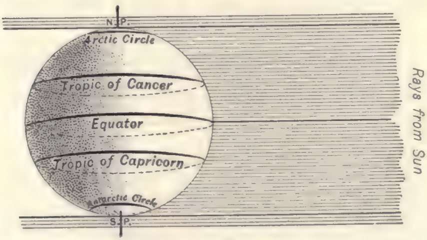


FIG. 33.

Position of the earth September 22.

On the 22d of September, the sun's rays are vertical at the equator, and its light just reaches the poles (Fig. 33). Now that the days are shorter than the nights, our summer is over.

By the 21st of December, the sun's rays are vertical at the *Tropic of Capricorn* (Fig. 34), and they reach far beyond the south pole, lighting and warming all the south frigid zone throughout the entire twenty-four hours. Then the north frigid zone is left in darkness. At that date, which is the beginning of winter with us and of summer in the southern hemisphere, the sun appears farthest south, and we have our shortest day. This is also the day when the sun's rays reach us at the greatest slant.

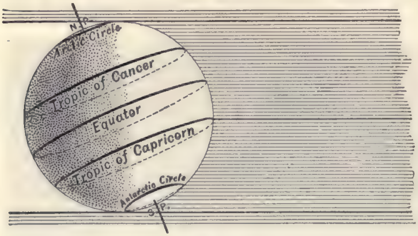


FIG. 34.

Position of the earth December 21.

As the earth revolves farther, the vertical rays of the sun fall farther north, reaching the equator again on March 21, when spring begins (Fig. 35). The 22d of September and the 21st of March are called the *equinoxes* (a word meaning equal nights), because the days and nights are then equal in length.

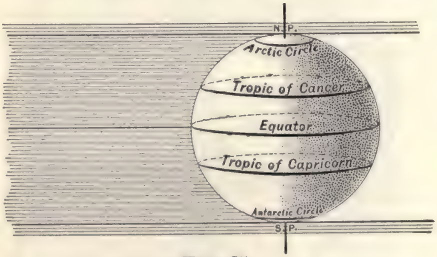


FIG. 35.

Position of the earth March 21.

On June 21, the rays are once more vertical over the *Tropic of Cancer*, and thus a year has been completed. Every year the earth makes this revolution, producing our seasons and constantly changing the length of our days and nights.

We see that these important changes are due to the inclination of the earth's axis and to the revolution of the earth around the sun. Can you think what would be the result if the axis were inclined considerably more? Carry an apple around the lamp in this different position to see. What changes would then have to follow in our mode of living? What if the axis were inclined less? What if it required more than 365 days for the earth to revolve around the sun? What if considerably less?

The Zones. — It will be remembered from the First Book (p. 120) that the Tropics and the Arctic and Antarctic circles form the boundaries of the zones; and, from what has just been said, it is evident that it is the sun's position in the heavens that fixes these boundaries. What is the position of the sun at noon of June 21 at the northern boundary of the north temperate zone? At the southern boundary? What is its position on December 21? Answer the same questions for the south temperate zone. For the torrid zone.

You will remember, of course, that there is nothing to mark the position of these boundaries, and that if a person should pass from one zone to another, he would find the change so gradual that he probably would not know when they were passed. Indeed, in some places, the climate is cooler within the torrid zone than it is outside that zone. Suggest some reasons why this is true.

Questions. — (1) What changes in the sun's position are noticed where the Eskimos live? What about the temperature? (2) How do the changes in the south frigid zone differ from these? (3) What conditions prevail in the torrid zone? (4) What changes occur in the temperate zone where you live? (5) In the south temperate zone? (6) In what direction do shadows fall in each of the zones? (7) What would be the effect if the earth's axis were always in the position shown in Figure 33? (8) If the north pole were always turned toward the sun? (9) If the south pole were always turned toward it? (10) What is the real position of the earth's axis? (11) What other motion besides rotation has the earth? (12) What determines the length of a year? (13) Why do we not notice the rapid move-

ment of the earth? (14) What prevents the earth from flying off into space? (15) Show how the revolution of the earth causes first one pole, then the other, to be turned toward the sun. (16) What are the two causes for our changes of seasons? (17) Why are the sun's rays less intense when the sun is low in the heavens than when it is higher? (18) On what day does the sun appear farthest north? (19) What does the Tropic of Cancer mark? The Arctic Circle? (20) When is the longest day at your home? What is the position of the sun then? (21) What about the southern hemisphere at that time? (22) What causes the sun to appear to move south after June 21? (23) When does our autumn begin? Our winter? (24) What does the Tropic of Capricorn mark? The Antarctic Circle? (25) When does our spring begin? Our summer? (26) What are the boundaries of the different zones?

SUGGESTIONS. — (1) Show by a globe, or a ball, how the two movements of the earth, rotation and revolution, can be going on at the same time. (2) How cold is it in winter where you live? How warm in summer? (3) How long is your day at present? Are the days growing longer or shorter? (4) During which months do they grow longer? (5) During which months shorter? (6) Measure the length of the shadow of a tall pole at midday, and observe whether it is growing longer or shorter each day. Why is it changing? (7) Make a drawing showing the five zones of the earth and the lines that bound them. (8) Notice the stars, especially those of the Great Dipper, in the fall and again in the winter, to see whether they also appear to change their position. (9) The axis of the earth always points nearly toward the north star. Should you expect that star to move also? Watch to see if it does. (10) What large stars can be seen in summer? In winter? Why different ones? (11) Have you ever seen an eclipse of the moon? What is the cause of one? (12) Write a story telling how the change from summer to winter affects your plays, food, and clothing. (13) Write another story about some changes that you have noticed, in plants and animals, which have been caused by the change in season. (14) Find just how many degrees the axis of the earth is inclined.

For REFERENCES TO BOOKS AND ARTICLES, see page 439.

III. WIND AND RAIN

Importance of Winds. — On some days the air seems too lazy to move; it is *calm*, and will neither lift kites, turn windmills, nor push sailing vessels. We have learned (First Book, Chapter VIII) that the air obtains vapor by evaporation of water, and that it takes much vapor from the ocean. We have also learned that the winds may carry this vapor for hundreds of miles before it is condensed into raindrops or snowflakes. If the air did not move, but were always calm, as on some days, there could be no vapor brought to form rain: then the continents would be deserts, and plants, animals, and men could not live upon them.

Winds do blow most of the time in all parts of the world, and they carry with them vapor enough to water most of the land. It will be important, therefore, to study the winds and see what causes them, what their prevailing directions are, and what effect they have upon the climate of different parts of the world.

The Sea Breeze. — The cause of winds is often well illustrated near the seashore. For reasons that cannot be stated here, land warms much more quickly than water. That this is so, you can easily prove for yourself by placing two pans upon a stove, one with a thin layer of dry earth, the other with the same quantity of water, and by noticing which becomes hot first.

On a hot summer morning, the land along the seashore soon becomes warm, and the air above it is heated, as over a stove, so that it expands and grows light. That over

the water, remaining cool like the sea itself, pushes in toward the shore; and thus a breeze from the sea, or a *sea breeze*, is created. In summer, such a breeze is frequently felt at the seashore and along the shores of large lakes, and it helps to make the temperature so agreeable that many people resort to those places during warm weather.

At night time, the land cools more rapidly than the sea; and then the cool air from the land moves out toward the sea, forming a *land breeze.*

The Monsoon Winds. — Similar winds blow from the ocean far into some of the continents. In Asia, for example (Fig. 36),

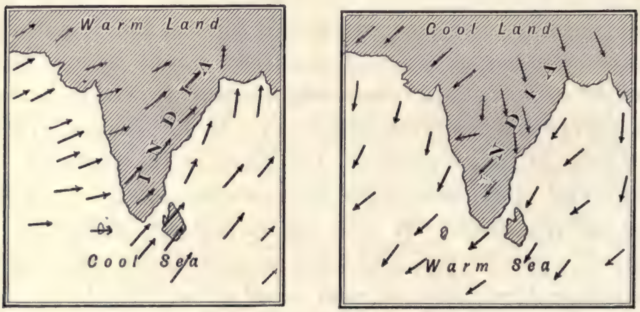


Fig. 36.

The monsoon winds of India, the arrows showing their direction. Which figure represents the summer season? Why do the winds change with the seasons?

where they are best developed, the land becomes so warm in summer that steady winds, called *summer monsoons,* blow from the cool ocean toward the warm land. But during the winter the land is much colder than the ocean, and then the *winter monsoon* blows from the land toward the sea. It is the summer monsoons blowing from the warm Pacific Ocean that cause the heavy summer rains in the Philippine Islands.

These winds are so steady near the coast that the captains

of sailing vessels bound for India count upon finding the wind blowing toward the coast in summer and away from it in winter. Summer monsoons also blow from the Gulf of Mexico over the plains of Texas and the lower Mississippi Valley, bringing vapor for rain. Notice on the map (Fig. 46, p. 50) that this is a very rainy region.

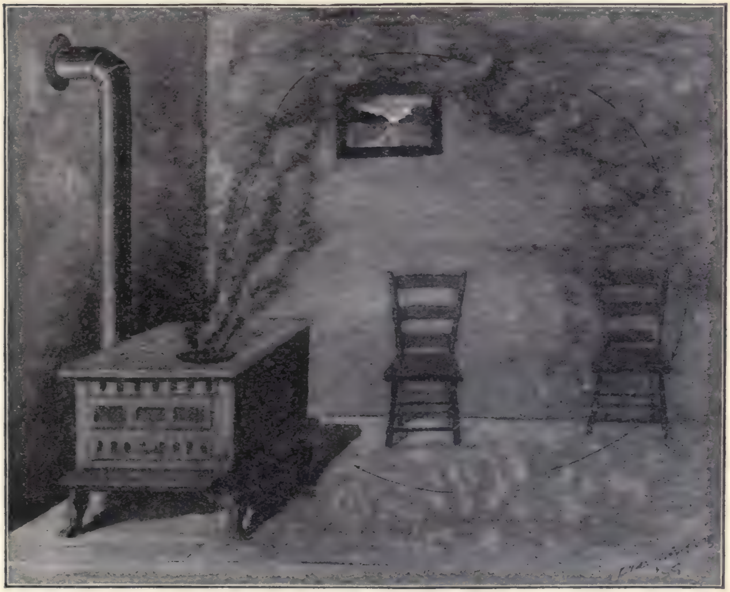


Fig. 37.

To illustrate how the air moves in a room heated by a stove.

The Effect of a Stove. — The difference in temperature of sea and land is not the most important cause of winds. There are other differences in temperature that are much greater; but in order to understand the winds that they produce, let us first consider the currents of air produced by a hot stove in a room (Fig. 37).

As the air near the stove is warmed, it expands and grows lighter. Then the cooler air settles down and flows in, forcing upward that which has been warmed. The latter grows cooler in contact with the cool ceiling and walls of the room; and, being made denser and heavier on that account, it again settles toward the floor and then once more moves toward the stove. In such a room you can easily observe how much warmer the air is near the ceiling, where it has risen from the stove, than near the floor at some distance from the stove.

Cause of the Trade Winds. — The greater winds of the earth may be compared to this movement of air in a room,

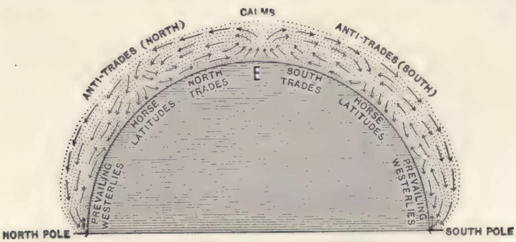


FIG. 38.

Diagram to show, by arrows, the movement of the greater winds of the earth.

the torrid zone, warmed by the sun's rays, taking the place of the stove. There, owing to the torrid heat, the atmosphere becomes expanded and light. The heavier air to the north and south flows in, pushing the light air away and producing winds, known as the *trade winds* (Fig. 38), which begin in the temperate zone, hundreds of miles away.

Since the heated air must escape somewhere, it rises far above the surface, and then moves back in the same direction from which it came, forming the *anti-trade winds* (Fig. 38). The atmosphere extends many miles above the earth,

so that there is plenty of room for two winds blowing in opposite directions, one above the other.

In Cuba, the Caribbean Sea, and elsewhere, where the trade winds at the surface are blowing toward the southwest, one notices that the clouds far up in the sky are steadily borne in the opposite direction by the anti-trades. Also, when volcanoes in Central America have been in eruption, the ashes that were blown out from them have been carried hundreds of miles in a direction opposite to that of the prevailing trade winds at the surface.

Being cooled on account of its great height, the air of the anti-trades slowly settles, some of it coming to the surface at about a third of the distance to the poles. There it spreads out, a part continuing on toward the poles, a part returning to the equator as the trade winds (Fig. 38).

As you see, the correspondence between these currents in the atmosphere and those in the room is quite close. In both cases air moves in toward a heated place, then up, then outward and down, and once more inward toward the heated part.

Effect of Rotation. — There are differences, however, and one of them is especially important. In the case of the room, the currents move *directly* toward the stove; then, after rising, directly away from it. If the earth stood perfectly still, the trade winds would doubtless blow directly toward the equator from the north and south (dotted lines, Fig. 39).

The daily rotation of the earth, from west to east, greatly interferes with that movement. Because of rotation, the trade winds are turned, or *deflected,* from their straight course toward the equator. Those from the north are turned to the right, so that they come from the *northeast;* and those from the

south are turned toward the left, and therefore come from the *southeast* (Fig. 39).

The direction of the anti-trades is also changed toward the right in the northern hemisphere, where they blow from the southwest, and toward the left in the southern hemisphere, where they blow from the northwest. Thus the anti-trades blow over the same route as the trade winds, but in the opposite direction. We can only state the facts here, for the explanation is far too difficult to give.

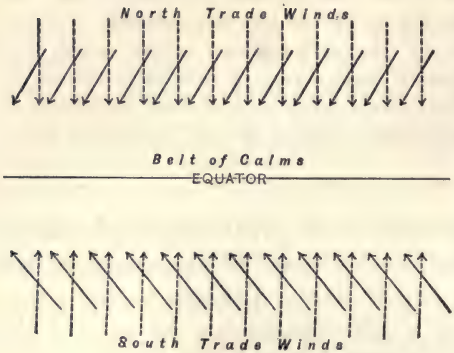


FIG. 39.

The dotted arrows show the direction the trade winds would take if the earth's rotation did not deflect them to the left in the southern hemisphere and to the right in the northern. By deflection they are turned as indicated by the other arrows.

Since the sun, which is the cause of the different zones of heat, has shone for millions of years, and will probably continue to shine for millions more, we may be certain that these great winds are *permanent winds*. The currents of air in a room cease when the stove grows cold ; but, for ages to come, the sun will heat the torrid zone more than the temperate. Thus the trade winds will be kept in motion day and night, winter and summer, as they now are, and as they were when they helped Columbus on his venturesome voyage across the Atlantic.

Effect of Revolution. — The belt of most intense heat is not always in exactly the same part of the earth, being north of

the equator in June, when the sun is vertical at the Tropic of Cancer, and south of it in December, when the sun's rays are vertical at the Tropic of Capricorn. This causes the trade and anti-trade winds to change their position somewhat, being farther north in summer than in winter (Figs. 40 and 42). So here is another important effect of revolution; for by it, in many places, the trade winds are caused to blow during a part of the year while they are absent during the remainder.

The Belt of Calms. — At the place where the air of the trades *rises*, that is, moves upward instead of along the surface, the winds are weak and irregular, often dying down to a calm. This is called the *belt of calms* (Fig. 38), or the doldrums. Over this belt, which is several hundred miles in width, the air grows cool as it rises, and the vapor which it carries is condensed, forming clouds and rain.

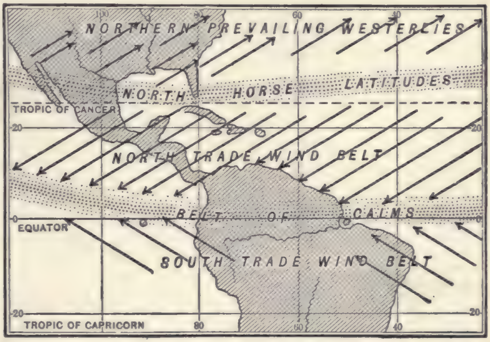


Fig. 40.

Diagram to show the position of the belt of calms and the trade winds in winter. Compare with Figure 42.

For these reasons the doldrums form a very rainy belt extending entirely around the earth (Fig. 44). Clouds begin to form there nearly every morning; and by afternoon, when earth and air have become much heated, the air rises more actively, and heavy showers occur, often accompanied by fierce thunder and lightning.

The rainy belt of calms is of course always in the torrid zone, and usually not far from the middle of it (Figs. 40 and 42). It is the heavy rain there that supplies the dampness necessary for the dense jungles of the tropical forests of the Amazon valley, Central Africa, and the East Indies.

This is one of the rainiest regions in the world; but the belt of calms is not always in the same position, moving northward

FIG. 41.

A scene in the dense tropical forest of the belt of calms.

in summer and southward in winter (Figs. 40 and 42). As a result of this, places having heavy rains in one season, when the belt of calms has moved to them, have much less rain in the opposite season. This is very well illustrated in northern Africa, between the Sahara desert and the Sudan, where there is plenty of rain in summer and very little in winter.

The Trade Wind Belt. — In blowing over the ocean, the trade winds obtain a great deal of vapor; and, as we have seen, some of this is condensed to form rain in the belt of calms. But some of it falls as rain before reaching that belt.

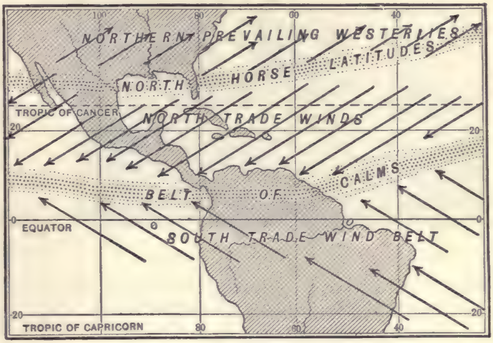


Fig. 42.

Diagram to show the position of the trade wind belts and the belt of calms in summer. Compare with Figure 40.

Notice in Figure 44 that much more rain falls on the eastern side of South America than on the western side. Notice also that south of the equator the trade winds blow from the southeast, while north of it they blow from the northeast. This causes them to reach South America after having passed over the Atlantic Ocean. Therefore the winds arrive on the eastern coast charged with vapor; then, as they rise over the land and become cooler, some of the vapor condenses to form rain.

From this it is evident that there is a very rainy region not only in the belt of calms, but also in those places, just north and south of it, where the trade winds blow from the ocean upon the land.

After having passed over the land, the air of the trade winds is often so dry that deserts are caused (Fig. 43). In the First Book (p. 249), it was stated that the winds

of Australia, which lies in the south trade wind belt, are robbed of their moisture by the highlands near the eastern coast. Thus the interior of Australia is a desert. There are also heavy rains in the trade wind belt on the eastern side of the Andes, while the western side, in Peru and Chile, is arid, although very near the ocean.

FIG. 43.

Picture of a desert. Notice the absence of trees. Contrast this with Figure 41.

In North America much the same thing is seen; for, while the eastern coast of southern Mexico has plenty of rain, central and western Mexico are arid, and in parts

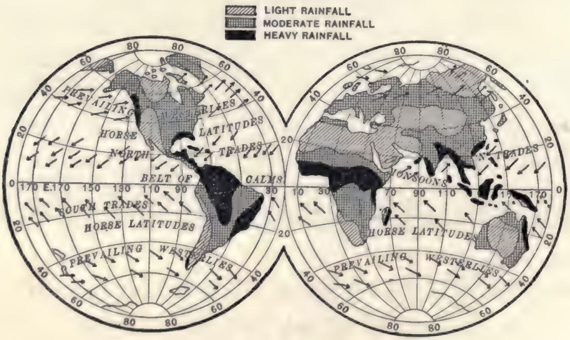


FIG. 44.

A small map of the world to show the regions of heavy, moderate, and light rainfall. The arrows show the direction of the prevailing winds.

almost a desert. The desert of Sahara is also in the trade wind belt, but the winds reach it only from the land.

We have said that both the trade wind belts and the belt of calms change their position somewhat with the season. This of course also changes the rainy belts each season. Therefore in parts of the torrid zone people speak of the rainy and dry seasons much as we do of the summer and winter.

The Horse Latitudes. — It was said (p. 43) that a *part* of the air of the anti-trades settles to the earth and returns as trade winds toward the belt of calms (Fig. 38). At this place there is a belt of light, variable winds with frequent calms, because the air is coming down instead of moving along the surface. This belt is known as the *horse latitudes.*[1]

While rising air becomes cool, thus causing clouds and rain, air that is settling and becoming warmer is dry and clear. Therefore in the horse latitudes there is little rain; indeed, there are numerous arid sections in this belt also, as the dry plateau of Spain, and the great deserts of central Asia.

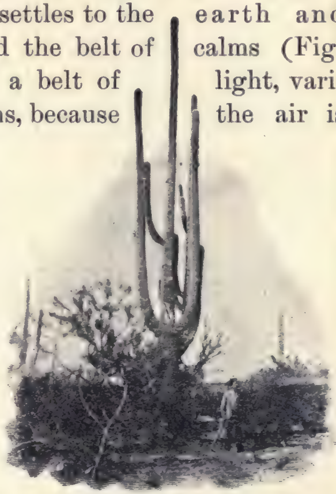


Fig. 45.

A giant cactus, on the desert of southern Arizona, in the horse latitudes.

The horse latitude belt extends across southern United States (Fig. 46), and this is one of the principal reasons for the dry plains of western Texas, and the arid regions of New Mexico, Arizona (Fig. 45), and southern California. Florida and the coast of the Gulf of Mexico are in the same belt;

[1] Called horse latitudes because sailing vessels, carrying horses from New England to the West Indies in the early days, were so delayed by the calms that the horses had to be thrown overboard when the drinking water gave out.

but they are so near the ocean that sea breezes and monsoon winds bring an abundance of rain to them.

The Prevailing Westerlies. — Not all the air of the anti-trades settles in the horse latitudes; some moves on toward

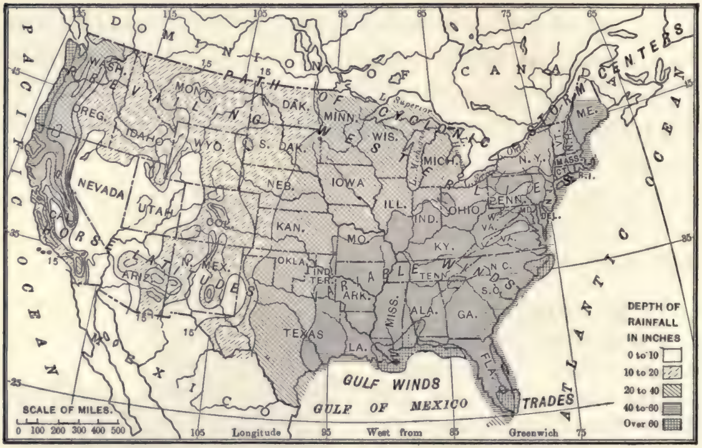


FIG. 46.

A map to show the rainfall of the United States in inches; that is, the number of inches of water that would collect all over the surface in a year if all the rain remained where it fell.

the poles (Fig. 38). If you watch the higher clouds, you will find that they are moving from the west toward the east. In northern United States the winds at the surface are also more often from the west than from any other quarter. This belt, in which the prevailing winds are from the west, is known as the region of *prevailing westerlies.* Northern United States and Canada are included in it (Figs. 44 and 46). Keep a record of the direction of the winds for each day during a month.

Winds are much more steady on the ocean than on the land for several reasons, the principal one being that the temperature of the water does not change so quickly as that of the land. On land one place may become much warmer than another not far away, and then winds blow toward the warmer section. This often changes the direction of the regular winds.

Fig. 47.

Two of the giant trees of the warm, rainy belt of northern California. Notice how small the man appears at the base of the first tree.

So steady are the prevailing westerlies over the ocean, that, in the southern hemisphere, where there is little land, they almost always blow from the west. Indeed, it is said that vessels, choosing a course south of Africa and South America, can sail around the world with fair winds almost all the way, if they go *toward* the east; but if they sail in the opposite direction, the winds are against them.

In the prevailing westerly belt, we would naturally expect a heavy rainfall on the west coasts, as we do on the east coasts in the trade wind belt. The map (Fig. 46) shows that this is so in the United States; and if Figure 44 were large enough it would show it for other sections of the world. For instance, south of the desert country of Peru and northern Chile, on the west coast of South America, there is an abundance of rain.

North of the arid country of Mexico and southern California

(Fig. 46) there is heavy rainfall from northern California to southern Alaska. It is in this rainy belt that the largest trees in the world are found (Fig. 47).

Depositing so much of their vapor on the mountainous land near the coast, these winds soon become too dry to produce much rain. It is for this reason that the plains and plateaus of Idaho, Montana, western Dakota, and other states of the northwest, are for the most part too arid for agriculture without irrigation.

Eastern United States and Canada. — One might expect that the west winds, so dry after passing over the mountains of the Western States, would continue on to the northeastern states and cause them to be arid also; but we know that this is not the case. It is true that the *west* winds rarely bring rain; but, in addition to them, there are east and south winds blowing from the Atlantic Ocean and the Gulf of Mexico, and these bring an abundance of vapor.

In northern and eastern United States the winds are variable, and the temperature is very changeable. In any particular locality on one day it may be warm and pleasant, with a south wind; the next day a cool, dry wind blows from the northwest; after two or three days this gives place to a cloudy sky and rain, brought on by south or east winds; and then fair, cool weather sets in, with the wind again from the northwest.

There are, of course, reasons for these frequent changes, and in order to understand them, let us follow the weather changes for a few days. Out in the northwest there comes to be a place, or an *area*, of *low pressure* (Fig. 49); that is, an area where the air is lighter than that over the surrounding region.

The air from the surrounding country, where the pressure is greater, hurries toward the low pressure area, even from hundreds of miles away, causing winds which on the south side blow from the south, on the east side from the east, and so forth (Fig. 49).

Toward the place where the pressure is low, the air is flowing in from all sides, then rising. As it rises, the vapor condenses, forming clouds and rain, as in the belt

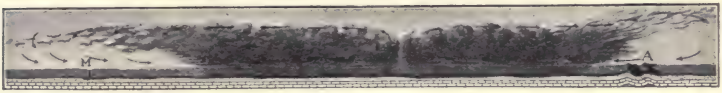


FIG. 48.

A section through a cyclonic storm to show the immense area of clouds and rain. A, represents the Appalachian Mountains; M, the Mississippi River. The direction of the winds is shown by the arrows.

of calms. Such an area of low pressure, with its clouds and rain, is known as a *cyclonic storm area* (Fig. 48), and it is during these storms that most of the rain of northeastern United States and Canada comes.

Instead of remaining in one place, the cyclonic storms steadily travel onward, usually beginning in the northwest and *always* passing eastward (Fig. 50). The paths followed by the storm centres generally pass over the Great Lakes, down the St. Lawrence Valley to the ocean, which they often cross, and reach even far into Eurasia. They move eastward because the prevailing westerlies carry them along: indeed, these great, whirling, cyclonic storms are apparently eddies in the prevailing westerlies, similar to the eddies in the current of a stream.

The area of country upon which rain may be falling from the clouds of one of these storms is sometimes very great, places fully a thousand miles apart sometimes receiv-

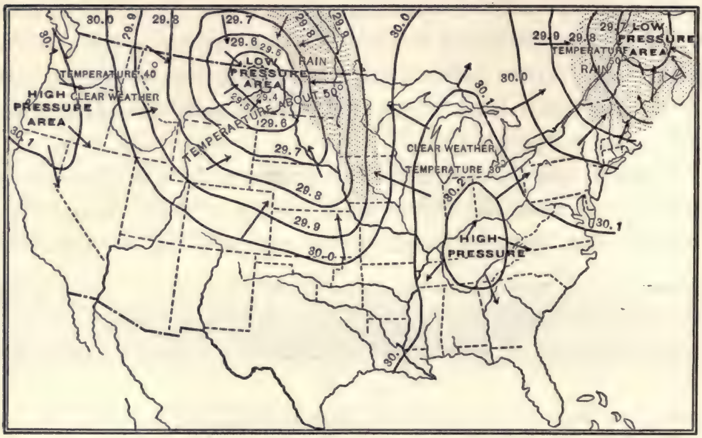


Fig. 49.

A weather map of the United States on a winter's day. The lines are lines of equal air pressure, — the lower the figure, the lighter the air (29.5 representing lighter air than 29.7). The pressure is determined by an instrument called the barometer. Study this map carefully and tell about the air pressure, winds, temperature, and rain in different parts.

ing rain at the same time (Fig. 48). As the storm moves eastward, it grows clear on the western side, while the cloudy and rainy parts appear farther and farther eastward (Figs. 49 and 50).

The vapor is brought toward the storm centre from the Gulf and the Atlantic Ocean, being carried by the winds for hundreds of miles, even into Canada. As stated on page 11, the fact that there is no high mountain range extending across southern United States is of great importance. If there were such mountains, instead of the low Appalachians and the open plains of the Mississippi Valley, the winds could not carry their vapor so far, but would drop it on the coast side, leaving the interior a desert.

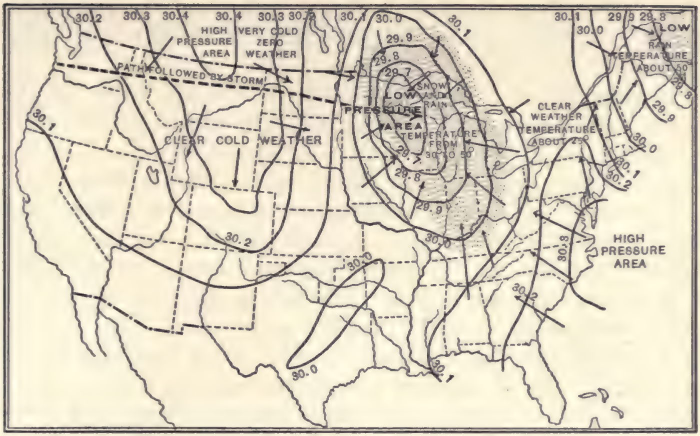


Fig. 50.

Weather map for the day following that of Figure 49. Study this carefully, and tell how it differs from Figure 49.

Not only are rains caused by these storms, but hot spells and other changes as well. Warm winds, blowing toward the low pressure areas from the south, are the cause of the winter thaws and the summer hot spells in the Eastern States. It is during these hot spells that thunder storms come; also, in some places, *tornadoes* (Fig. 51), often called "cyclones," in which the winds blow so fiercely that trees are overturned and houses torn to pieces.

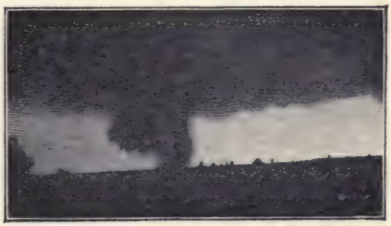


Fig. 51.

Picture of a tornado in Illinois that did great damage because of the fierce winds which accompanied it.

After a low pressure area has passed eastward and the storm is over, the wind generally blows from the west. This causes cool, dry weather in summer, and cold snaps in winter.

Then it is said that a *cold wave* has come; and this, sweeping over the East, and even far into the South, often does great damage to fruit trees and other delicate plants.

Weather Maps. — Figure 49 shows a cyclonic storm in the northwest, the arrows indicating how the winds blow in from all sides toward the centre of low pressure. Farther east is a region of high pressure. In Figure 50, the high and low pressure areas are again represented; but, since it is a day later, they have moved eastward; and the following day they would be still farther east. You see from these maps how the direction of the wind for any one locality has changed as the low pressure areas have passed over the country.

Although the cause of these storms is not yet fully understood, they are so regular, and their importance is so great, that the United States government has established a *Weather Bureau* which employs a large force of men, stationed in different parts of the country, to observe the pressure of air, direction of wind, etc., and to telegraph the facts to Washington. These observations, made at the same time at all stations, furnish information which enables men to foretell the weather. Their predictions are greatly aided by the fact that all of the storms and high pressure areas will move eastward.

Maps, similar to those of Figures 49 and 50, called *weather maps*, are also sent out. By the predictions of the Weather Bureau, farmers and gardeners are warned against damaging frosts, and sailors against severe storms. Hundreds of thousands of dollars are saved in this way nearly every year.

Especially valuable service has been rendered by the Weather Bureau in predicting the very fierce *hurricanes* that arise in the West Indies and sometimes do great damage there, as well as on our own coast. These resemble the cyclonic storms, but are much more destructive.

Since the storms and high pressure areas have so great an influence on our weather, you will find it of interest to study the weather yourself. Watch the changes in wind, temperature, clouds, and rain; and if there is a barometer at hand, observe how it changes as the high and low pressure areas come

and go. A great aid to such a study will be found in the weather maps, on which are printed full information about the weather each day and predictions for the next day. See how nearly correct these predictions are.

Questions. — (1) In what ways are winds important? (2) Explain the sea breeze. (3) How are monsoons caused? (4) Where are they found? (5) Describe the circulation of the air in a room heated by a stove. (6) What is the cause of the trade winds? (7) Of the anti-trades? (8) What proofs have we that the anti-trades blow steadily? (9) What becomes of the air of the anti-trades? (10) Compare this circulation to that of air in a room. (11) What effect has rotation on the direction of these winds? (12) Why may we feel certain that these winds are permanent? (13) What effect has revolution of the earth upon the position of the trade wind belts? (14) Describe the conditions in the belt of calms. (15) What effect has the change of seasons upon the position of this belt? (16) What about the rainfall of eastern coasts in the trade wind belt? (17) Of western coasts? (18) In what way do the trade winds help to cause deserts? (19) What influence upon rainfall has the change of the trade winds with the season? (20) What are the horse latitudes? (21) What about the rainfall there? Why? (22) Name some desert sections in that belt. (23) What are the prevailing westerlies? (24) Are they best developed on the land or the water? Why? (25) In the southern or northern hemisphere? Why? (26) What effect have the prevailing westerlies upon rainfall? Give examples. (27) What is the cause of the dry plains of the northwest? (28) Which winds are dry in northeastern United States? Why? (29) Which winds bring vapor? Why? (30) Mention several changes of weather that may often be noticed within a few days. (31) Tell some that you have recently noticed yourself. (32) What happens when there is a low pressure area surrounded by higher pressure? (33) What is a cyclonic storm? Of what importance are such storms? (34) Tell about their movement. (35) Tell about the rain. Whence does it come? Over how much country does it fall? (36) What changes in temperature occur? (37) Explain the two maps (Figs. 49 and 50). How are they different? How alike? (38) What are the duties of the Weather Bureau? (39) What are weather maps? (40) Of what value is the work of the Weather Bureau?

Suggestions. — (1) Estimate the number of barrels of water that falls on an acre of ground, or upon a city block, in one year, where the rainfall is forty inches. (2) How is a movement of air secured in your schoolroom in order to ventilate it? (3) Show on a map or globe where the trade wind belt is on the Atlantic; the belt of calms; the horse latitudes; the prevailing westerlies. (4) Inquire of some one who has been in the torrid zone about the winds and rains there. (5) Do the same for Arizona and southern California. (6) If you live in the northeastern states, watch how the winds blow before and after a storm. (7) Examine a map sent out by the Weather Bureau. Perhaps your teacher can have them sent regularly by writing to the Weather Bureau at Washington. (8) Keep records of the weather. (9) Find a barometer and notice how it changes from day to day. (10) Write a description of a tornado from an account in the newspaper. (11) Read once more the section on "Air" in the First Book, page 71. (12) Write an account of the change in the weather for five days in succession: — the wind direction and force; the clouds; rain; temperature; and, if possible, the air pressure.

For References, see page 439.

IV. OCEAN MOVEMENTS AND DISTRIBUTION OF TEMPERATURE

LIKE the air, the ocean water is in motion, its three principal movements being wind waves, tides, and ocean currents.

WIND WAVES

Waves are formed by winds which blow over the surface of the water and ruffle it, sometimes, during storms, causing it to rise and fall from twenty to forty feet.

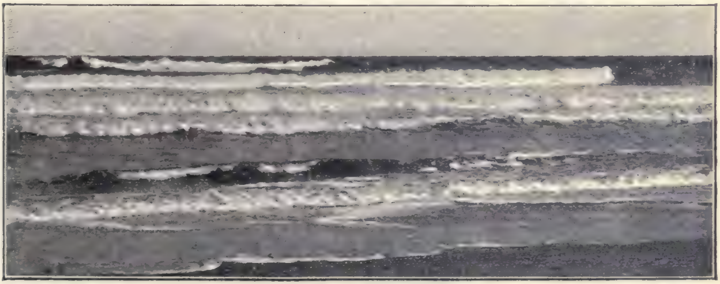


FIG. 52.

Surf on the New Jersey coast, caused by the breaking of the waves as they approach the beach.

In the open ocean, waves are rarely very dangerous to large vessels; but upon the seashore, they do great damage to vessels and even to the coast itself, wearing away the rocks and dragging the fragments out to sea. The constant beating of the waves (Fig. 52) is slowly eating the coast away.

Tides

What the Tides are. — People living upon the seacoast are familiar with the fact that the ocean water rises for about six hours and then slowly falls. This rising and falling of the water twice each day forms what is known as the tide. For a long time it puzzled men to explain this: it was called the breathing of the earth, and by certain uncivilized races it is to this day thought to be caused by some great animal.

Fig. 53.
High tide on a part of the New England coast.

As a result of careful study, we have learned that the tides are caused by the moon and the sun, especially the former. Each of these bodies is pulling upon the earth, by the attraction of gravitation, as a horseshoe magnet pulls upon a piece of iron. When the sun and moon pull upon the earth, the ocean, being a liquid that can be moved, is drawn slightly out of shape. This causes two great

Fig. 54.
The same region as Figure 53 at low tide. Compare the two figures.

swells, or waves (Fig. 55), many hundreds of miles broad, which pass around the earth, following the moon. When

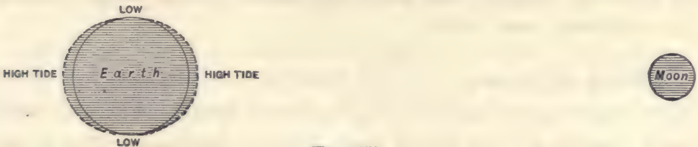


FIG. 55.

A diagram to show how the moon pulls upon the earth and causes the tide waves. Of course their height is not so great as the diagram suggests.

these swells reach the shores, they cause the rise of water known as the tide.

Height of the Tidal Wave. — The tidal wave is only two or three feet high upon headlands which project into the open ocean; but it rises a great deal higher in many bays. There the wave is raised higher because the space that it occupies becomes narrower near the head of the bay. In some such places, as in the Bay of Fundy, the tide reaches a height of forty or fifty feet.

FIG. 56.

Position of earth, moon, and sun at new moon, when *spring* tides are caused by sun and moon pulling together.

The height of the tide also varies from day to day, for the moon and sun, which combine to form it, do not always work together. At new moon and full moon, when the earth, moon, and sun are nearly in one line (Fig. 56), the moon and sun pull together and make the tidal wave higher

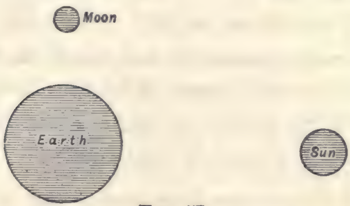


FIG. 57.

Earth, sun, and moon at the quarter of the moon, when sun and moon do not pull together.

than at the quarter, when the moon is forming a tidal wave in one place and the sun in another (Fig. 57). The high range of tides at full and new moon are called *spring* tides, those at the quarters, *neap* tides.

Effects of Tides. — In the open ocean the tides are of no importance, and a sailor might spend weeks at sea without ever knowing that there were tides. But along the coast, where the water rises and falls against the beaches and cliffs, the tides are very noticeable (Figs. 53, 54) and important.

Fig. 58.

Sandy Hook, on the south side of New York Bay, built of sand driven along by the waves and tidal currents, and then piled into sand dunes by the wind.

Where the coast is irregular, the tide is often changed to a *current*, which sometimes moves so rapidly that a sailing vessel cannot make headway against it, but must wait until the tide changes. Such a rapid current is found in one of the entrances to New York harbor, at what is known as Hell Gate, where the channel is narrow and rocky.

These tidal currents, moving in one direction during the incoming or *flood* tide, and in the opposite direction during the outgoing or *ebb* tide, not only aid ships which are going with them, and retard those going against them, but they sometimes

drift vessels out of their course and place them in dangerous positions. Many a ship has been lost by being wrecked upon a coast where it was drifted by the tidal currents.

Another effect of the tidal currents is upon the harbors. These currents often carry sand hither and thither (Fig. 58), and build bars opposite the mouths of harbors. This is one of the reasons why the harbors of our Southern States are no better (p. 20). In order to prevent some of them from being entirely shut in by bars, the government is obliged to spend large sums of money every year in order to remove the sand brought by the tidal currents.

Ocean Currents

Cause of Ocean Currents. — The winds which blow over the ocean, forming waves, also drive the water before them. You may do this in a small way by blowing on the surface of a pail of water. This starts a current, or *drift*, of surface water in the direction that the air is moving. Where the winds are steady, as in the trade wind belts, or moderately steady, as in the prevailing westerlies, there is a permanent drift of water, pushed along by the prevailing winds. These form the great system of ocean currents (Fig. 59) which have such an important influence on the earth.

Differences of temperature are also a cause of some movement, as in the case of the air. But since the sunlight cannot reach to the bottom of the ocean, the water there is not warmed, as the lower layers of the air are. Therefore a circulation exactly like that of the atmosphere is not found in the ocean. There is, however, a slow settling of cold water in the frigid zones, a movement along the ocean bottom, and a very slow rising in the torrid belt. While this movement is so slight that it can scarcely be noticed, it is because of this drift of water

that the temperature of the ocean bottom is so low. Even at the equator, the temperature of the ocean bottom is nearly at the freezing point.

The North Atlantic Eddy. — Let us now study the main ocean currents on each side of North America (Fig. 59).

In that part of the Atlantic where the trade winds blow (Fig. 44, p. 48), the surface water drifts slowly in the direction of the trade winds; that is, toward the belt of calms. It then moves westward, as a great *equatorial drift*, until the easternmost extremity of South America interferes with its course. There the drift of water is divided, a part being turned southward, while the greater portion proceeds northwestward.

The part which flows northward is deflected toward the right by the effect of rotation, as the winds are (p. 43); and the part which flows into the South Atlantic is turned to the left, also by the effect of rotation. Therefore, the northern drift, instead of coming near to the mainland of North America, keeps turning to the right, crossing the Atlantic to Europe. It then passes southward, and finally returns to the trade wind belt where it started, having made a complete circuit.

Coming from the equatorial region, this water is warm, and in it live countless millions of animals and floating plants. Among the latter, one of the most abundant is a seaweed, called *Sargassum*, which is thrown into the middle of this great eddy. There it has collected until it now forms a "grassy" or "*Sargasso*" *sea* hundreds of miles in extent. Since the "Sargasso" Sea lies directly between Spain and the West Indies, Columbus was obliged to cross it on his first voyage of discovery; and his sailors, upon entering it, were much alarmed lest they might run aground, or become so entangled in the weed that they could not escape.

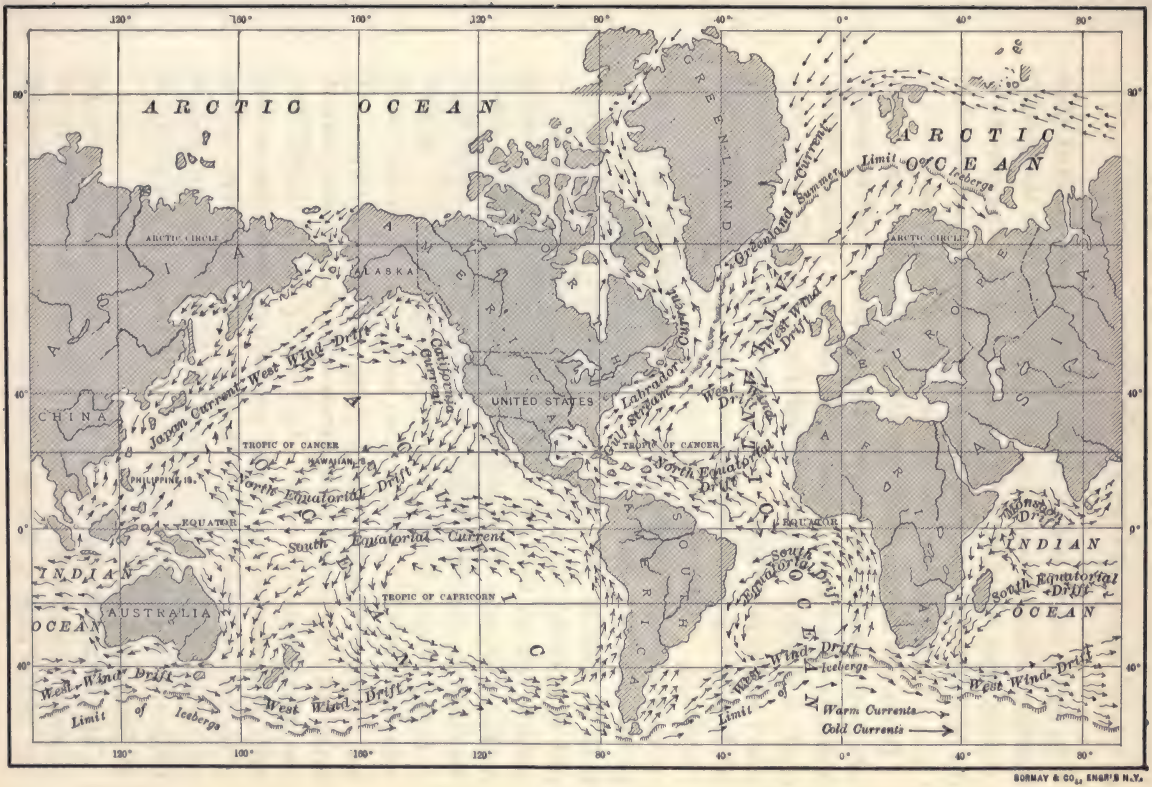


FIG. 59.

A chart showing the principal ocean currents and ocean drifts of the world. Compare their direction with that of the winds on Figure 44, page 48. Study this map carefully. Make a sketch map somewhat like it.

As the drift of warm water eddies round toward the European coast, it carries some of the warmth of the torrid zone to that continent. This is one of the reasons why the climate of northern Spain is warmer than places in the United States at the same distance from the equator.

The Gulf Stream. — A portion of the drift of water which moves northward along the northern coast of South America enters the Caribbean Sea and then passes into the Gulf of Mexico. This is a broad, deep, gently flowing current; and it is so nearly surrounded by the warm tropical lands that it grows even warmer than when it entered the Caribbean. After swirling round the Gulf of Mexico, it escapes between Cuba and Florida, after which it is known as the *Gulf Stream* (Fig. 59) because it comes from the *Gulf* of Mexico. Being forced to pass out through so narrow an opening, its rate of movement is much increased — even to four or five miles per hour — as water in a hose is made to increase its speed by passing through the nozzle. Measure the distance from Key West to Havana (Fig. 95).

Being turned to the right by the effect of the earth's rotation, the Gulf Stream soon leaves the American coast and flows northeastward toward northern Europe. It broadens rapidly and joins forces with the western part of the great Atlantic eddy. In crossing the Atlantic, the drift is pushed along by the prevailing westerlies, so that it reaches the shores of northern Europe, and even enters the Arctic Ocean. Some idea of its size may be gained from the fact that it carries many times as much water as all the rivers of the world.

The Labrador Current. — After being cooled, some of this water settles to the bottom and finds its way back to the torrid zone in the slow drift of cold water which is

forever moving along the ocean bottom from the frigid zone toward the equator (p. 63). But much of it returns at the surface, for there is a cold surface current, called the *Labrador current*, passing southward along our north-eastern coast (Fig. 59).

The Labrador current flows down from among the islands of North America, past the coast of Labrador, Newfoundland, Nova Scotia, and New England. Like all ocean currents in the northern hemisphere, it is turned toward the right, that is, since it flows southward, toward the west. This causes it to follow our coast very closely, keeping nearer our shore than the Gulf Stream does.

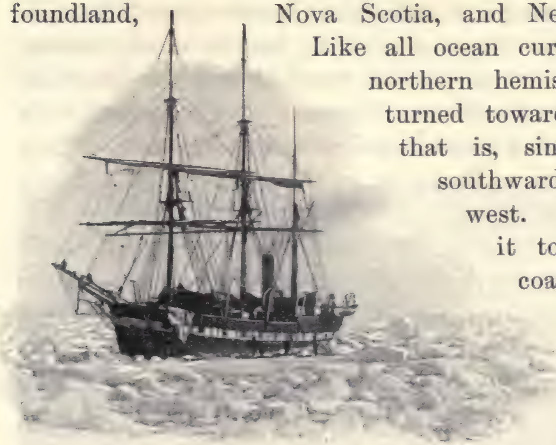


FIG. 60.

An Arctic whaling steamer imprisoned, off the coast of Baffin Land, in the floe ice which is being carried southward in the Labrador current.

Since there are two currents near together, a cold one from the north, and a warm one from the south, a vessel sailing from Boston to England must cross both. During winter storms a ship often becomes covered with snow and ice while in the cold Labrador current, but loses this coating soon after entering the Gulf Stream.

Where the cold and warm currents come near together, a dense fog is produced. You can doubtless explain why that is so (see First Book, p. 77). Sailors who cross the Atlantic have learned to expect heavy fogs as they pass near the coast of

Nova Scotia and Newfoundland, which is one of the foggiest regions in the world.

The Currents in the Pacific Ocean. — In the Pacific Ocean, as in the Atlantic (Fig. 59), the water drifts westward in the belt of calms; then a broad, warm current swings to the right past Japan, crossing the ocean toward Alaska, as the Gulf Stream crosses the Atlantic toward Europe. This, called the Japanese current, carries much warmth from the torrid zone to the North Pacific, as the Gulf Stream does to the North Atlantic. Continuing to turn to the right, this current passes southward to complete the great eddy. There is another eddy in the South Pacific, similar to that in the South Atlantic.

We see from what has been said, that, although the Gulf Stream flows past the Southern States, the northeastern coast of North America is bathed by an ocean current from the cold north. On the other hand, the northwestern coasts of Europe and North America are approached by warm currents from the south. That is, because of the earth's rotation, the warmer water is swung to the western coasts of the continents rather than to the eastern.

The Importance of these Currents. — The facts just stated are of great importance to us. Since the Gulf Stream crosses the Atlantic in a northeasterly direction, it hinders the passage of vessels bound westward, or *against* its current. Benjamin Franklin noticed this effect of the current when he was Postmaster General of the American Colonies shortly before the Revolutionary War. He arranged for the carrying of the mails by ship between England and America, and one fact that he observed was that vessels went to Europe in less time than they re-

turned. After studying the matter carefully, he decided that the Gulf Stream drift was the cause.

While this ocean drift is a hindrance to vessels sailing against its current, it is in other respects of great service. From its warm waters the air obtains much vapor, which falls as rain in the United States and Europe; and in its warm current a vast amount of heat is carried northward. When Nansen started on his famous journey toward the north pole, he entered the Arctic Ocean with this current. Thus, since its warm water keeps that part of the Arctic free from ice in summer, he was able to proceed much farther than he otherwise could have gone.

FIG. 61.

Icebergs that have broken off from the Greenland glacier.

The Labrador current flows as far south as Cape Cod, so that the water north of this promontory must be cooler than that south of it. As the cold current leaves the Arctic region, it bears with it much sea ice which has been frozen during the preceding winters (Fig. 60), and also gigantic icebergs which have broken off from the Greenland glacier (Fig. 61). It is upon this drifting ice that the polar bear spends much of his time hunting for seals which live in great numbers in the ice-covered waters (Fig. 62).

The icebergs may be carried southward one or two thousand miles before the air and water melt them away (see limit of icebergs on Fig. 59). Indeed, some icebergs float even as far south as the paths followed by vessels which cross the Atlantic. Since many bergs are larger than the greatest building in the world, collision with one means shipwreck; therefore sailors need to use great caution, especially when the ship is in the fog.

FIG. 62.

Polar bear and seal on the floe ice of the Labrador current.

The cold Labrador current affects the temperature upon the land. Winds blowing over it carry the chill far inland. This is one of the reasons why the east winds of New England are so cool and why the New England coast is such an agreeable summer resort.

The warm Japanese current of the Pacific Ocean renders the southern part of Alaska far warmer than southern Labrador, which is farther south; and the prevailing westerlies bring an abundance of vapor to the Pa-

cific coast all the way from California to Alaska. Where these winds blow, the winters are mild and the rain heavy; but the summers are cool and pleasant, because the ocean water, though warm, does not become greatly heated. Notice on a globe that the state of Washington, with its pleasant climate, is about the same distance from the equator as the bleak island of Newfoundland, whose shores are bathed by the cold Labrador current.

The world, as a whole, as well as certain small sections, is greatly influenced by these ocean currents. It has been estimated that the Gulf Stream drift carries one-half as much heat into the Arctic as reaches it from the direct rays of the sun. In this way a great deal of northern country, which would otherwise be scarcely habitable, is made to support vast numbers of people. Notice on a map how many large cities are in that part of northern Europe which is the same distance from the equator as desolate Labrador.

Besides thus influencing many parts of the earth, the warm currents have helped to form a great number of islands. Where warm currents flow, the water is often warm enough for corals to live; and, since the moving water brings to them an abundance of tiny animals for food, colonies of corals flourish, and their skeletons gradually form reefs. In this way the southern half of Florida, the Bahamas, the Bermudas, and many of the islands in the South Pacific were built.

Distribution of Temperature

In general, it is true that the farther north we travel from the equator, the colder it grows; but this is by no means always the case. If the earth were made of one solid, level substance, like glass, the temperature *would* gradually decrease from the equator to the poles. Then

all points the same distance from the equator, as all on the Tropic of Cancer, or all on the Arctic Circle, for instance, would have the same temperature.

But we have seen that there are several causes which interfere with this regular decrease in temperature toward the poles. For example, high mountains have a cold cli-

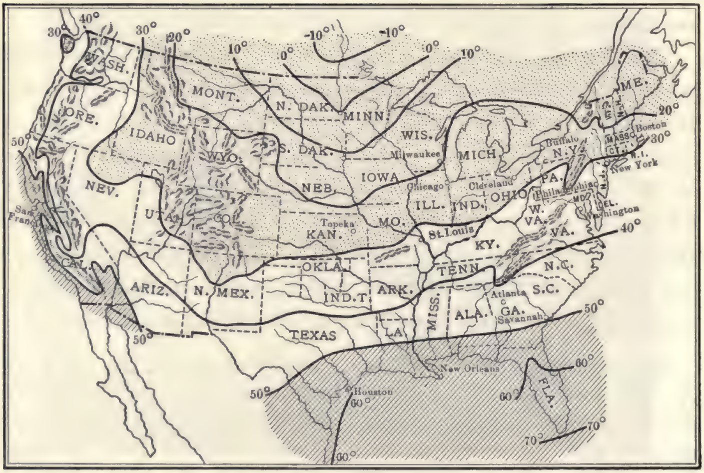


FIG. 63.

Isothermal chart of the United States for January. Why is it colder in the interior than on the east coast? Why so warm on the west coast? Can you notice any influence of mountains?

mate, even though in the torrid zone; and, for the same reason, plateaus may be colder than lowlands far north of them.

Besides that, land warms and cools much more rapidly than water (p. 39), so that land becomes hotter in summer and colder in winter than the ocean. Thus, in northern Minnesota, far from the coast, the average temperature

in January is below zero, while in July it is about 65° (Figs. 63 and 64). In New York City, on the coast, the average in January is about 25°, and in July not quite 75°. On the west coast, in the state of Washington, where the winds are blowing from the ocean, the average temperature for January is 40° and for July 60°.

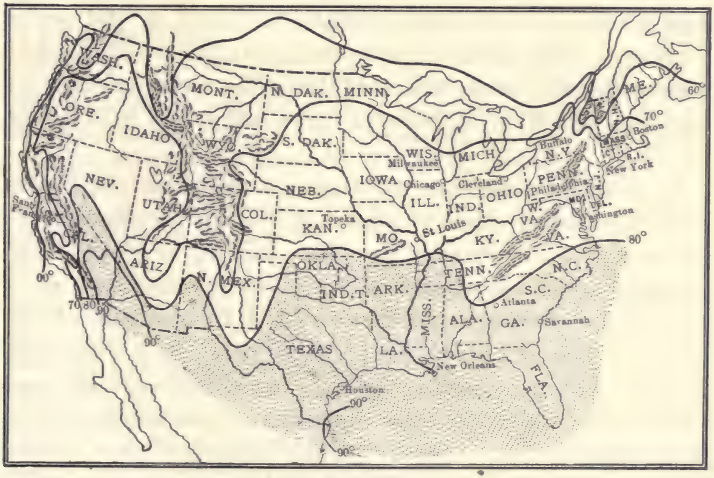


FIG. 64.

Isothermal chart of the United States for July. Notice the influence of the Rocky Mountains. Of the Appalachians. Why is it cooler on the west coast than on the east coast? What makes the isotherms bend northward in the Mississippi Valley?

At Key West, Florida, which is surrounded by water, the average temperature in January is about 70°, and in July about 85°. Where the temperature changes but little, the climate is said to be *equable*. Compare San Francisco and St. Louis in the two charts (Figs. 63 and 64).

The winds greatly influence the temperature. Where

they blow from the ocean, they cause an equable climate, as in California, near San Francisco; but where they blow from the land, they are cool or cold in winter and warm in summer. This is true of the Eastern States, where most of the winds blow from the land, though some of the damp winds come from the ocean.

Another cause for different temperatures in places equally distant from the equator is found in the ocean currents. We have already seen that the Gulf Stream warms the air, while the cold Labrador current cools it, and that this air in movement forms warm and cold winds (p. 70).

If, therefore, we were to draw a line across the continent, connecting several points that have the same average temperature during any one month, or during the entire year, it would need to be a very crooked one, with some parts reaching much farther north than others. Such lines tell so much about temperature in so little space that it is the custom to make maps to show them, as in Figures 63 and 64. Since the lines connect the places having the same temperature, they are called *isothermal lines* or *isotherms.* (The first part of the word means *equal*, and the latter part *heat.*) A map or chart showing the isotherms is called an *isothermal chart* (Figs. 63 and 64). Trace several of the isotherms across the United States, and explain why they bend as they do.

REVIEW QUESTIONS: *Waves and Tides.* — (1) Of what importance are the waves? (2) How often does the tide rise and fall? (3) What causes it? (4) What causes it to vary in height from place to place? (5) From time to time? (6) What important effects have tides?

Ocean Currents. — (7) Explain how winds help to produce ocean currents. (8) What is the cause of the cold water on the ocean bottom? (9) Describe the drift of tropical waters in the Atlantic.

(10) Trace the drift which passes outside of the West Indies to the European coast. (11) Describe the Gulf Stream. (12) Describe the Labrador current. (13) Trace the warm Japanese current. (14) What parts of the coast of North America are bathed by warm currents? By cold currents? (15) Tell about the discovery of the Gulf Stream by Franklin. (16) Of what importance is this current? (17) Tell about the ice which floats down with the Labrador current. (18) How does this current affect the climate of New England? (19) What influence has the Japanese current on the climate of western North America? (20) In what ways have the warm currents aided the building of many islands?

Distribution of Temperature. — (21) What about the change in temperature from equator to poles if the earth were a round ball of glass? (22) How is this change interfered with by elevation? (23) By distance from the ocean? (24) Give several examples. (25) What influence have the winds? (26) The ocean currents? (27) State several reasons why it is not always true that the farther north one goes, the colder it grows. (28) What is an isothermal line? (29) An isothermal chart?

SUGGESTIONS. — (1) If your home is upon the seacoast, find out about the high and low tides for several days in succession. (2) Notice the relation between the height and the time of high tide, on the one hand, and the changes in the moon, on the other. (3) From an almanac find out what the time and height of tide will be for some day in the following month. How do you think this prediction is possible? (4) Is the government obliged to spend money near your home to remove materials which the tidal currents have brought? (5) What course might a vessel take in order to be carried from Europe to America and back again by ocean currents? (6) What precautions do vessels take to avoid running into one another in dense fogs? (7) How do they try to avoid collisions with icebergs? (8) Learn more about Nansen's voyage. (9) Which of the isothermal lines on Figures 63 and 64 are nearest to your home? (10) Which isotherm on Figure 63 runs near New York and northern New Mexico? Near Savannah and San Francisco? Through southern Maine and southern Nebraska? (11) On Figure 64, which isotherm runs through northern Maine and San Francisco? (12) How about the distance of these points from the equator?

For REFERENCES, see page 439.

V. CLIMATE, PLANTS, ANIMALS, AND PEOPLES

FIG. 65.

A map of North America, to show the four plant zones. Notice how irregular the boundaries are. Compare it with the isothermal chart, Figure 64, to see the cause. Also examine the relief map of North America, Figure 5.

Climate. — We have learned in the previous sections that several factors combine to determine the weather and climate of North America. The principal factors are (1) distance from the equator, (2) the changes of season, (3) elevation of the land, (4) distance from the ocean, (5) winds and storms, and (6) ocean currents. All these together determine the temperature and rainfall, which are the two most important elements of climate.

The climate of a region is one of the most important facts concerning it; for where temperature and rainfall are

favorable, plants usually grow luxuriantly. And since plants furnish animals with food, where vegetation is luxuriant, animal life may be abundant.

Since North America extends far north and south, and possesses lofty mountain ranges and enclosed plateaus, it has a great variety of climates, and, therefore, a great variety of plant and animal life (Fig. 65).

Plants of the North. — The northern part of the continent is bitterly cold. In that region there is a vast area where the soil is always frozen, excepting at the very surface, which thaws out for a few weeks in summer. On account of the frost, trees such as we are familiar with cannot grow. Their roots are unable to penetrate the frozen subsoil and to find the necessary plant food. There are some willows, birches, and a few other plants with woody tissue, bark, leaves, and fruit; but instead of towering scores of feet into the air, they creep along the surface like vines, and rise but an inch or two above ground. Only by thus hugging the earth can they escape the fierce blasts of winter and find protection beneath the snow.

Fig. 66.

Arctic poppies growing on the edge of a snow-bank.

A few grasses and small flowering plants grow rapidly, produce flowers, even close by the edge of snowbanks (Fig. 66), and then pass away, all within the few short weeks of summer. Some of these plants produce berries, which after ripening are preserved by the snows; thus, when the birds arrive in the spring, they find food ready for them.

Animals of the North. — The summer development of insects is rapid, like the growth of plants. As the snow melts and the surface thaws, the ground becomes wet and swampy, and countless millions of insects appear. Among them the most common is, apparently, the mosquito. There are few parts of the world where this creature is a worse pest than on the *barrens* of North America and the *tundras* of Europe and Asia, as these treeless, frozen lands are called.

Few large land animals are able to thrive in so cold a climate and where there is such an absence of plant food. The reindeer, or caribou, the musk-ox, polar bear, white fox, and Arctic hare are the largest four-footed land animals (Fig. 67); and the crow, sparrow, and ptarmigan are the most common land birds.

The ptarmigan changes its plumage to white in winter, and other animals of the Arctic, such as the fox, polar bear, baby seal, and hare, are also white. This serves to conceal them, in that land of snow and ice, so that they may hide from their enemies, or steal upon their prey unawares.

The tiny white fox feeds upon birds and other animal food; but the other land animals, except the polar bear, live upon plants, such as berries, grass, and moss. The caribou finds a kind of plant, called "reindeer moss," which grows upon rocks that rise above the deep winter snows. If it were not for this, the reindeer would not be able to live through the long winter.

Fig. 67.

Some of the animals of the North. The great auk had such small wings that it could not fly. It was killed in great numbers by sailors, and has been completely exterminated.

While some animals live upon the land in the Arctic regions, many more have their homes in the sea, because there, excepting at the very surface, the temperature never descends below the freezing point. Therefore, there is plenty of animal life of all sizes, from the very tiniest forms to the whale, the largest animal in the world (Fig. 254, p. 326). During the winter the surface of the sea freezes over; and then many of the sea animals migrate southward. Even the huge walrus (Fig. 68) moves clumsily toward a more favorable climate. The birds go farthest, especially the geese, ducks, and gulls, which fly to Labrador, New England, North Carolina, and even farther south, to spend the winter where their food is not covered by ice.

FIG. 68.
Walrus on the Arctic floe ice.

Sea birds exist by hundreds of thousands (Fig. 67), building their nests upon rocky cliffs in immense numbers. Indeed, they are so numerous that, when suddenly frightened, as by the firing of a gun, they rise in a dense cloud that obscures the sun. Then, by their cries they produce a din that is almost deafening. In the water live seals (Figs. 62 and 286) and walruses, the former being so valuable for their oil and skins that

men go on long voyages to obtain them. The oil comes from a layer of fat, or "blubber," just beneath the skin, that serves to keep out the cold.

The seal is the most common of the Arctic sea animals, and is the principal food of the Eskimo and the polar bear (Fig. 62). The bear, protected from observation by his white color, stealthily creeps upon his prey, asleep upon the ice; or, he patiently watches until his victim swims within reach, and then seizes him in his powerful claws.

Life on Mountain Tops. — In many respects the life on mountain tops resembles that of the Arctic regions. On the crests of lofty mountains it is cold, and large animals are rare, while the plants resemble those of the cold North (Fig. 74). There are no trees, though creeping willows and birches abound. Indeed, some of the plants are actually the same as those of the North. For instance, on the top of Mt. Katahdin, Maine, some of the plants are of the same species as those thriving in Labrador, Baffin Land, and Greenland. Arctic plants also occur on the mountain tops in North Carolina.

Plants and Animals in Western North America. — A large area in western United States and Mexico has a very slight rainfall, although its temperature is agreeable. This arid area includes most of the territory having less than twenty inches of rain (Fig. 46, p. 50). In some places, as near the Pacific coast and upon the mountain tops and high plateaus, there is rain enough for forests to thrive; but in most parts of the Far West the climate is so dry that there are no trees whatsoever. Indeed, some portions of the West are desolate in the extreme and almost devoid of life, both plant and animal; in other words, they are true deserts.

One common plant is the bunch grass, so called because it grows in little tufts or bunches. The sage bush, a plant with a pale green leaf, named because of its sagelike odor,

is found throughout most of this arid region. Other common plants are the mesquite, the century plant with its sharp-pointed leaves (Fig. 304, p. 383), and the cactus with its numerous thorns. In favorable spots, especially in the warm southwest, the mesquite grows to large size; and the cactus, which in the north is always low and represented by only a few kinds, in the southwest, as in Arizona, grows in great variety and, in some cases, even to the height of trees (Figs. 69 and 45, p. 49).

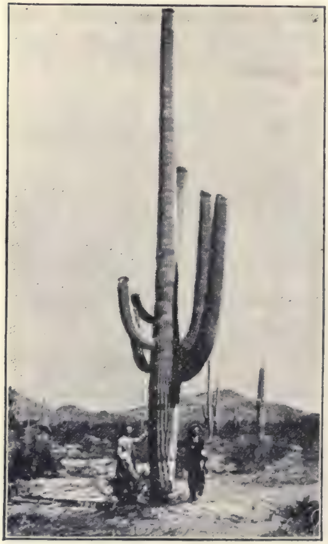


FIG. 69.

Giant cactus in the desert of southwestern Arizona.

FIG. 70.

One of the peculiar plants of the arid lands, growing to the size of a tree in the warm, dry climate of southern Arizona.

On account of the extreme dryness of the climate, these plants have a severe struggle for existence, and adopt peculiar means for protecting themselves. For example, the cactus, unlike other plants, has no leaves. It thus exposes little surface to the air for evaporation. In its great, fleshy stem it stores water to use through the long, dry seasons, while spines protect it from ani-

mals in search of food. The mesquite also protects itself by spines, and in addition has such large roots that the part of the plant under ground is greater than that above. Many of these plants, as the mesquite, are so bitter that they are not eaten by animals.

Animals eat few of the arid land plants except the grasses, which were once the food of the buffalo or bison (Figs. 71 and 76), and are now the support of cattle and sheep (Figs. 77 and 288, p. 362). The bison, whose home

FIG. 71.
Photograph of a young bison.

was on the prairies and the arid plains east of the Rocky Mountains, is now gone; and few large animals are left in its place. The cowardly prairie wolf, or *coyote*, and the graceful antelope and the rabbits upon which it feeds, are the most abundant (Fig. 72). Among the rabbits is the long-legged jack rabbit, which leaps across the plains with astonishing speed, with its huge ears thrown back so far that they do not retard its progress.

The traveller through the arid lands meets with few more interesting creatures than the prairie dogs which live in small communities, called prairie-dog towns (Fig. 72). Their homes

FIG. 72.

Some of the animals of the plateaus and mountains of the Far West.

are in the ground and their food consists of grass. They do not venture far from their burrows for fear of the coyotes which may be lurking near; and upon the least alarm they utter a shrill note and tumble headlong into their burrows.

There are birds and some lower animals, as the poisonous tarantula, centipede and scorpion, besides snakes, especially the poisonous rattlesnake (Fig. 72).

The fierce puma or mountain lion still lives among the mountains, and also the ugly cinnamon and grizzly bears (Fig. 72), though the latter are now rare and difficult to find. Deer and elk inhabit the forest-covered mountains of southern Canada and northwestern United States; and among the higher peaks a few mountain goats and sheep still live on the more inaccessible rocky crags (Fig. 72). The sheep have huge horns much prized by hunters.

Plants and Animals of the Tropical Zone. — Contrast the life in the frozen North and the arid West with that in Central America and southern Mexico. In these regions, which are situated in the torrid zone, the temperature is always warm; and the rainfall, especially on the eastern coast, is so heavy that all the conditions are favorable for dense vegetation.

Indeed, the tangle of growth in the forests is so great that it is practically impossible to pass through it without hewing one's way. Besides trees and underbrush, there are quantities of ferns, vines, and flowers, many of which hang from the trees with their roots in the air instead of in the ground (Fig. 41, p. 46). They are able to live this way on account of the damp air. Among the trees are the valuable rosewood, mahogany, ebony, and rubber tree; and among the flowers are the beautiful orchids. On account of the continual warmth and moisture, many plants, like the banana for instance, bear fruit throughout the year.

In the midst of such luxuriant vegetation, animal life is wonderfully varied and abundant. There are the tapir, monkey, and jaguar (Fig. 73); brilliantly colored birds, such as parrots, paroquets, and humming birds; and millions of insects. Scorpions and centipedes abound, and ants exist in countless numbers, some in the ground, others in decayed vegetation. Serpents, some of them poisonous, are common in the forests; and in the rivers are fish and alligators, the latter being found as far north as Florida and Louisiana.

The plants and animals of the torrid zone are well adapted to their surroundings, like those of the Arctic and the desert. The jaguar and ocelot are speckled, or spotted, like a surface upon which the sunlight plays when it has struck through deep shade; the brown alligator is in color much like the mud banks on which he lies; and all the brilliantly colored animals are in harmony with the intense lights and the bright hues of tropical plants. This resemblance to their surroundings aids them in hiding, whether from their own enemies, or from the creatures which they are seeking for food.

Plants and Animals in the Temperate Part of North America. — Between the frigid and torrid zones, and both east and west of the arid region, is an area of *moderate* rainfall and temperature where the vegetation and animals differ from those of the other sections. Beginning in the warm South and passing northward, we find that both animals and plants grow less numerous and less varied until, near the Arctic zone, they become scarce and few in kind. The pines and oaks of the United States give place to the spruce, balsam fir, and maple in Canada; then these gradually become stunted and disappear (Fig. 74), and beyond this the barrens are reached (p. 78).

FIG. 73.

A few of the animals of the tropical forests.

The animals that once inhabited the broad temperate zone have been mostly destroyed, although some still live in the forest and mountain region. They are carefully protected by state laws, which prohibit shooting except at certain seasons, and then only in small numbers. When America was first visited by Europeans, these woods abounded in deer, moose, caribou, wolves, and foxes (Fig. 75). Beavers built dams across the streams, the mink and otter fished in the waters, and bears roamed at will.

Fig. 74.

Appearance of the trees at the tree line, both on the slopes of mountains and near the Arctic zone.

Among the birds, the eagle was common (Fig. 75), and wild pigeons and turkeys were so abundant that they were one of the principal foods of the early settlers.

Some believe that at one time most of eastern United States was wooded, including the fertile prairies of the Mississippi Valley, from which the trees were burned by fires set by the Indians. Grass then sprang up in place of the trees, and the prairies became the grazing place for immense herds of bison (Figs. 71 and 76). The bison, however, like the other animals mentioned, have been mostly destroyed; thousands upon thousands were slaughtered for their hides and tongues alone, and

Fig. 75.

Some of the animals of northeastern United States and southeastern Canada.

their bones left to whiten upon the plains. There are now no wild bison in the United States, except a few which are protected by the government in the Yellowstone National Park. In this Park, where hunting is prohibited, are numbers of deer

FIG. 76.

One of the immense herds of bison that formerly roamed over the treeless plains.

and elk (Fig. 72). There are also black, cinnamon, and grizzly bears, which are so tame that they come down to the hotels at night to feed upon the garbage.

Cultivated Crops and Domesticated Animals. — A slow change has been in progress in this temperate section, which, when first discovered, was clothed in forests and luxuriant prairie grass, and inhabited by Indians and wild beasts. The white man has come into possession of the land and has cleared the forests and ploughed the prairies, so that, where trees stood and Indians hunted game, there are now fertile farms and thriving cities.

The laws of climate that determine what kinds of plants and animals shall live in the different sections, are also

governing man himself to a certain extent. He is able to raise sugar and cotton in the South; but north of this there soon comes a belt where these crops cannot be raised, though corn may be produced. Still farther north, even corn cannot be grown, but oats, barley, and other hardy crops. Farther north still, man has been obliged to leave nature much as it always has been. In the arid lands, however, he has been able to raise products, even in the desert, wherever water can be led to the thirsty soil.

His domesticated animals have also been influenced somewhat by surroundings. In the arid portions of the

FIG. 77.

Cattle feeding on the Great Plains, where the herds of bison formerly roamed.

Far West, cattle have been allowed to roam in a semi-wild state where the bison formerly lived. But in the more humid central, eastern, and southern sections, where the land is better suited to agriculture, cattle are more carefully reared. Those in the West are raised principally for their meat and hides; but those in the East furnish, in addition, milk for butter and cheese.

Crops and domesticated animals well illustrate how man has learned to make use of nature for his needs. Every one of our

cultivated plants was once a wild plant; and each of our domesticated animals has been tamed from the wild state. Most of these have come from Europe and Asia; but America has added some to the list. Among plants in common use, the Indian corn or maize, the tobacco, tomato, pumpkin, and potato were unknown to the Old World until America was discovered. The same is true of the turkey; and perhaps, in a hundred years or so, the bison may be included among the domesticated animals, for on the cattle ranches of the West a few small herds are being carefully reared.

Peoples

Eskimos. — America was inhabited for thousands of years before it was discovered by white men. To the natives in the southern part Columbus gave the name *Indians*, supposing he had reached India. Those in the Far North, who subsist on meat, are called Eskimos, a word meaning flesh-eaters.

Fig. 78.
An Eskimo woman carrying her baby in the sealskin hood on her back.

To-day, in some places, the Eskimos live in very nearly the same condition as formerly, their climate being so severe that white men have not settled among them nor interfered with their customs. They still roam about in summer, living in skin tents, or *tupics*, and in winter erecting snow and ice huts, or *igloos* (Fig. 79). Their struggle is a hard one, for they not only have to battle against cold, but also to obtain their food amid great difficulties. In this they are aided by their dogs, which are doubtless domesticated wolves, and which, like their masters, are able to subsist upon a meat diet and with-

Fig. 79.

Eskimo igloos in Baffin Land.

stand the severe Arctic cold. Every Eskimo man has his team of dogs to draw his sledge over the frozen sea.

Indians. — Indians were originally scattered over most of the country south of the Arctic Circle. This is indicated by the places that bear Indian names, as Narragansett, Erie, Niagara, Huron, Ottawa, Illinois, Dakota, Pueblo, and Sioux City. Some of the tribes were true *savages;* others, not so savage, may be classed as *barbarians.* They raised "Indian corn" and tobacco, baked pottery, used tools and weapons made of stone, and lived in villages.

These two classes of Indians had no settled homes, but roamed about. They generally followed regular paths, however, moving from place to place with the season. Their

homes were skin tents commonly pitched in a group and forming a village. The women and children spent most of their time in the villages, near which were fields of Indian corn cultivated by the women. The men fished along the seashore, on the lakes, or on the rivers, and hunted in the forests or on the prairies. They travelled about through the woods, sometimes along the rivers in their birch-bark canoes, sometimes on foot along narrow paths, or *trails.*

FIG. 80.

The pueblo of Taos in New Mexico. Notice the ladders leading to the roofs upon which are the house entrances.

In southwestern United States, Mexico, and Central America the aborigines were more civilized. Much of that region is arid; but the Indians raised crops by irrigation, and built fortresses of stone and sun-dried brick (Fig. 80). These were erected partly as homes for protection from surrounding savages, and partly as storehouses for grain.

The most noted among these Indians were the *Aztecs,* who occupied the city of Mexico and some of the neigh-

boring country. They had government and religion much better developed than the barbarous and savage tribes. They mined gold and silver and manufactured the metals into various articles; they wove blankets, and ornamented their pottery and their buildings in an artistic manner. Living the quiet life of the farmer, the Aztecs preferred peace

FIG. 81.
Indian blankets, woven by one of the tribes near the boundary line between New Mexico and Arizona.

FIG. 82.
Indian carrying a decorated pottery jar.

to war, and a settled home to the nomadic life of the hunter. But even these Indians were not truly civilized; they lacked many of the arts of civilization, as for instance, that of writing, though they, together with other Indians, were able to convey their ideas by drawing pictures.

While some tribes thus approached a state of civilization, the Indians, as a race, never became a powerful people. For this there are several reasons. Instead of forming one great confederacy and living at peace with one another, they were divided into many tribes.

Each tribe had a certain area over which it could roam and hunt; but if it encroached upon its neighbors, war followed. Under these circumstances it was difficult for one tribe to advance to a much higher state of civilization than the others.

The level nature of the country rendered this difficulty all the greater. Had the surface of North America been very mountainous, some tribes might have been so protected by surrounding mountain walls as to dare to devote themselves to other work than war. Then they might gradually have collected wealth and developed important industries; but the vast plains of the Mississippi Valley, which make up so much of the continent, and the extensive plains and low mountains of the East, allowed little protection. If any one tribe had built good homes on these plains, and collected treasures within them, the neighboring Indians would have felt that a special invitation had been extended to attack them. The Aztecs were continually in danger from this cause. However, the fact that they were *partly* protected by mountains and deserts, especially in southern Mexico, was one of the reasons why they were more civilized than the Indians of the northeast.

Fig. 83.
Indian woman carrying her baby, or *pappoose*.

Another serious obstacle to the advancement of the Indians was the fact that they possessed no domestic animals for use in agriculture. The horse, cow, ass, sheep, goat, and hog were unknown to them; and, without these, farm work becomes the worst drudgery, because every product must be raised by hand. It is not surprising, then, that the men left the farming to the squaws, while they spent their time in war and in hunting.

Again, although there was much game, the supply was never sufficient to support a dense population for a long period. Even the scattered Indian population was obliged to wander about in search of it. This prevented them from living quietly and finding time for improvement. All these facts worked against the advancement of the Indians; but they proved of great advantage to the whites, making it far easier than it would otherwise have been for them to obtain possession of America.

The Spaniards. — The astonishment of Europe was great when it was proved that there were vast territories on this side of the Atlantic. America was pictured as containing all sorts of treasures, and European nations vied with one another in fitting out expeditions to take possession of them.

The Spaniards naturally led, for they were then one of the most powerful nations of Europe and had sent out Columbus as their representative. Leaving Palos in Spain on his first voyage, he came within reach of the trade winds, which carried him southwestward to one of the West Indies, a point much farther south than Spain itself. Find on a globe the point on our coast that is about as far north as Madrid. Had Columbus started from England, he would have sailed into the prevailing westerlies, instead of the trade winds; and, although the distance is shorter, the voyage would have required a much longer time. Why?

The section reached by the Spaniards had a climate similar to that of their own country, and they easily made themselves at home there and soon came into possession of most of South America, Central America, Mexico, and southwestern United States. They had one advantage over the English and French who settled farther north: the portion of the continent that they discovered is so

narrow that they easily crossed it, and thus enjoyed the privilege of exploring the Pacific coast also. It was because of this fact that the Spanish race settled the western coast as far north as San Francisco.

After robbing the Aztecs of immense quantities of gold and silver, the Spanish converted the natives to Christianity, and introduced many Spanish laws and customs. They cruelly mistreated the natives, killing many and enslaving others, and forcing them to work in the mines and fields. They almost completely exterminated the Indians who lived in the West Indies. While the invaders were able to conquer the semi-civilized Aztecs and the barbarians of the islands, they made very little progress in subduing the more savage tribes. To this day, in fact, there are tribes of Indians in Mexico and Central America that have never been conquered, and that frequently cause trouble.

The French. — The French began their settlements in a very different quarter, being first attracted to our coast by the excellent fishing on the Newfoundland banks. Soon the fur trade with the Indians proved profitable, and the French took possession of Nova Scotia and the region along the St. Lawrence River and the Great Lakes.

The value of the fur trade, and a desire to convert the Indians to Christianity, led the French far into Wisconsin and to the head waters of the Mississippi River. Making their way southward to the mouth of that river, they took possession of the whole Mississippi Valley (Fig. 84), and called it Louisiana in honor of their great king, Louis XIV. In order to hold this vast territory, they established a chain of trading posts and forts from the Gulf of Mexico to the Gulf of St. Lawrence. One of the most important of these forts stood where Pittsburg now stands.

What special advantage had the French for reaching so much of the interior of the continent? Why should they not have proceeded westward to the Pacific? Many places in the St. Lawrence and Mississippi valleys still preserve French names, as Lake Champlain, Marquette in Michigan, La Salle in Illinois, St. Louis, and New Orleans.

The English. — The Spanish and French left only a narrow strip along the Atlantic coast for other nations. Among those who attempted settlements were the Dutch in New York and the Swedes in Delaware. But the English, settling at various points along the coast, soon obtained the lead. They captured New York City (then called New Amsterdam) from the Dutch, and extended their settlements along most of the coast from Florida to Nova Scotia.

FIG. 84.

Map showing the claims of France, England, and Spain upon the territory of Central North America in 1760.

In several respects the portion that fell to the English seemed much less desirable than that held by the Spanish and French; yet the English speaking race has managed, not only to retain this, but to add to it most of the possessions of the other two. At the present time, the control of the entire continent, with the exception of Mexico,

Central America, and a few small islands, is in the hands of either the United States or Great Britain.

There are, of course, good reasons for this strange result. No doubt original differences between these three races is one cause; but there are others also. In the case of the Spanish, the climate has been one factor; for in a large part of their territory the weather is too warm to produce energetic people. In very cold countries, as in the land of the Eskimos, so much labor is required in merely obtaining food and shelter, that little time and strength are left for general improvement. The struggle is too severe to allow progress.

In warm countries, on the other hand, the same effect is produced, but in the opposite way. So *little* energy is required to find sufficient food that the people do not *need* to exert themselves, and hence do not. By taking a few steps, the Central American can find bananas and other nourishing food at almost any season of the year; why then should he work? The people, therefore, lose the inclination to bestir themselves, or, in other words, become too lazy to improve their condition.

Fig. 85.

A primitive Mexican cart with wooden wheels, such as can still be seen in that country.

Another reason why the Spaniards have not developed is found in their relation to the Indians. Although robbing and enslaving them, they at the same time married them freely, so that, in time, half-breeds have come to make up more than half the population. These half-breeds are an ignorant class, far inferior to the Spaniards themselves, and so backward (Fig. 85) that they still follow many of the customs of the Aztecs.

The French likewise intermarried with the Indians and

adopted some of their customs, although not to so great an extent as the Spaniards. Their climate was, on the whole, more favorable than that of the Spanish; for, though cold in the St. Lawrence Valley, the temperature was conducive to effort. But one of their greatest difficulties arose from the fact that the few scattered settlers were unable to protect all of the vast territory to which they laid claim.

As for the English, the temperate climate of their section is the best in the world for the development of energy. The warm summers allowed abundant harvests; but the long, cold winters forced the settlers to exert themselves to store supplies for the cold season. Since it required only a reasonable amount of labor to obtain the necessities of life, time and energy were still left for improvement.

In their treatment of the Indians, the English and French were less cruel than the Spaniards; but, unlike both French and Spanish, the English would not intermarry with savages. Consequently, in the wars with the French, the English were not hampered by great numbers of half-civilized persons, and could act with more intelligence, speed, and force. Their relation to the Indians, however, placed them at a disadvantage in one respect; for, during the fights with the French, a majority of the Indians were allies to those with whom they had intermarried, and, hence, were friends to the enemies of the English.

The fact that the English were hemmed in by forest-covered mountains on the west, and by the French and Spanish on the north and south, also proved an advantage; for on that account they were kept close together, and were easily able to combine their forces when wars arose.

These are some of the reasons why the English-speaking race has won its way on the continent against both Spanish and French. Spain has steadily lost ground, having recently given up Cuba and Porto Rico to the United States; and France has had no claim upon the continent since 1803. The Spanish race still occupies Mexico and Central America, while French is even now spoken by many people in New Orleans, Quebec, and Montreal.

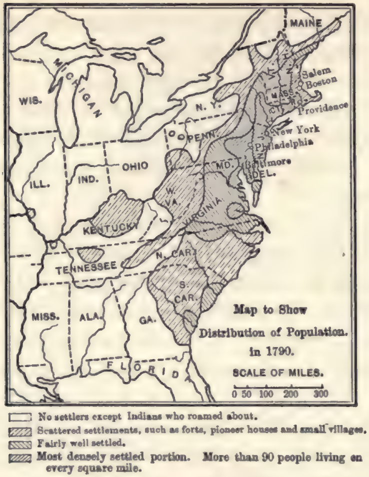


FIG. 86.

Map to show the settled part of the United States in 1790. Notice the cities named; each of these had over 5000 inhabitants. Which are now among the great cities of the country? What about Chicago?

Westward Migration. —After the Revolutionary War, by which the Thirteen Colonies gained their independence from Great Britain, an active westward movement began. For a long time the Appalachian Mountains had stemmed the tide of migration (Fig. 86). But at last numbers of pioneers found their way, along the river valleys, to the other side of these mountains. There they discovered fertile plains, free from rocks and woods, and ready for the plough; and their enthusiastic reports quickly drew hundreds of thousands after them.

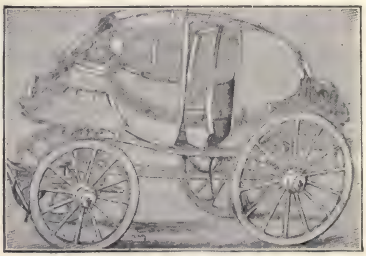


FIG. 87.

A stage coach used three-quarters of a century ago to travel through the wilderness of western New York.

The westward advance pushed the frontier line on and on until the semi-arid plains of the West were reached. Then, in 1848, the discovery of gold in California produced a wave of excitement that carried hosts of adven-

turers across the Rockies to the Pacific coast. After this the western part of the United States was rapidly explored and settled.

Indian Reservations. — Through this movement the Indians found themselves driven from their hunting grounds, and their resentment toward the whites led to many a massacre. However, they were outnumbered by civilized people, and, in spite of their stealth, courage, and endurance, were soon a conquered race.

It has been necessary to confine the Indians to certain regions, called *Indian reservations,* in various parts of the East and West. There are small ones in Maine, New York, and Florida, and larger ones in the West; but the largest is Indian Territory, just north of Texas.

In collecting the Indians upon reservations it was intended to encourage them to adopt civilized customs, to build homes, and to cultivate the soil. For that purpose the government has placed *Indian agents* upon the reservations to supply the Indians with necessary articles, such as farming tools, seed, clothes, and, in time of need, food also. Often each Indian is assigned a small farm to cultivate as he chooses, and his children are sometimes forced to attend a school.

While the plan has worked well in some cases, for the most part it has proved a dismal failure. The Indians have been roaming about for too many generations for all of them to be ready to settle down peaceably and toil at farming. Many of them are too lazy for this kind of work; and, even after taking the trouble to prepare the ground and sow the seed, they sometimes abandon their crops in order to hunt and fish.

The government system of supplying them with necessaries encourages them in their shiftlessness, for they know that when winter comes they will not be allowed to starve. Other reasons for the failure are, unfortunately, dishonesty of the Indian agents in some cases, and also the failure of the government to carry out its agreement with the Indians. In other cases, the allotment of poor land to the Indians has caused trouble. We owe it to the red men to see that they are offered

every chance to rise to civilization, and the reservation system has not led to that result.

There are, of course, numerous exceptions, for many tribes and individuals have greatly profited from government aid. Some have shown themselves capable of a high degree of civilization, as is proved by the students in the Indian schools at Hampton, Virginia, and Carlisle, Pennsylvania. A better system of treatment for the Indians is now being tried ; that is, to do away with reservations, to supply each Indian with a farm, and to force him to depend upon himself.

Slavery. — While the Indians of the East were being killed in war and driven westward, negroes were being brought from Africa. There are now fully eight million blacks in the United States, which is nearly one-ninth of our entire population, and thirty times the number of Indians.

Slavery was first introduced into America by the Spaniards, who made slaves of the Indians, and afterward imported negroes from Africa. The first negro slaves in the British colonies were brought to Virginia in 1619, but their number increased very slowly until the close of that century. The demand for cheap labor was partly supplied by criminals sent over from England, and by other immigrants who gave their services for a few years in payment for their passage across the sea. Many of these were men and women of good character, who became respectable citizens. Many others, however, were outcasts from society.

As the settlement of Virginia increased, and slave labor was substituted for that of the "poor whites," the latter, often the descendants of the bond-servant of early days, sought refuge on the southern and western frontier. Some of the descend-

ants of these people have become most respectable citizens, others form the so-called "white trash," which are found scattered through the Southern States. Among their descendants, too, are some of the people who dwell among the mountains, living to this day the life of the backwoodsman, and now and then engaging in illegally distilling whiskey from corn raised in small patches on the mountain slopes.

Negro slaves were brought to all the colonies, but they soon proved a much more profitable investment in the South than in the North. In New England the farms were small, the products were numerous and their cultivation required considerable skill. Moreover, the climate was severe for natives of tropical Africa. On the other hand, the Southern climate was well suited to them; and the simple routine work upon the great tobacco, cotton, sugar, and rice plantations was such as they could easily perform. Accordingly, the number of slaves increased in the South, while slavery gradually disappeared from the North.

Fig. 88.
A negro group in the South.

When steam began to turn the factory wheels of England, the demand for cotton from America greatly increased; and the invention of the cotton gin, in 1793, made its production far more profitable than before. On

that account the slave-trade grew into an enormous industry, and slavery became apparently a necessary institution in the Southern States. Men, women, and children were bought by slave-traders, — often Northerners or foreigners, — and sold to the plantation owners.

Since slavery was abolished by the Civil War, the number of negroes has increased in the South, although many have migrated to the North and West. In most cases the slaves were well treated by their owners, but they were of course very ignorant, and the close of the war found the great majority of them totally unfitted for the duties of citizenship. It has been one of the great problems to determine what shall be done to educate and improve the condition of the negro. Many people in both North and South are deeply interested in it, though it is a matter in which the South has the more vital interest, since there are so many negroes in the Southern States, where they are depended upon to perform most of the labor. It is believed that the problem of improving the condition of the negroes is being solved by such schools as that at Hampton, Virginia, and Booker Washington's Tuskegee Institute in Alabama.

Immigrants to America. — Europe and Asia, as well as Africa, have poured forth a stream of immigrants into this country. Our increase in population, from a little over three millions at the close of the Revolutionary War to over seventy-six millions at present, has been possible only as a result of this steady stream from abroad. Nearly every foreign nation is represented, and upon the streets of our larger cities may be heard the languages of most of the civilized peoples of the globe.

The greater part of our immigrants has come from northern Europe, especially from the British Isles, Germany, and the Scandinavian peninsula (see table, p. 454);

and great numbers of them have settled in the cities. More recently a flood of immigration from southern Europe has brought us less educated and less desirable people. At one time many Chinese threatened to come, and laws preventing their coming had to be passed. We have laws, also, excluding paupers, criminals, and laborers who are brought here by contract. To others the country is free, though many believe that very ignorant persons should be prevented from immigrating here.

It has been our mission to welcome these strangers, and, in spite of their varying ideas, customs, and languages, to teach them the principles of a republican form of government, to educate them, and, welding them into an harmonious body, to make them good citizens and true Americans. It is not strange if some mistakes have been made in the process. It is a task that no other nation has ever performed on so grand a scale. Nevertheless, the fact that so few of the many foreigners who settle among us desire to return to their native lands is proof that they have not been disappointed in their expectations; and it suggests reason for a well-founded pride in the government of the United States, and a hope for its future.

Review Questions. — (1) What factors determine climate? (2) Of what importance is climate? (3) Why are there no large trees in the cold North? (4) Describe the vegetation there. (5) What animals live on the land there? (6) Tell what you can about each. (7) Why are there more animals in the sea? (8) What kinds live there? (9) How does the life of mountain tops resemble that of the frigid zones? (10) How do arid land plants protect themselves? (11) Tell what you can about the animals living in the arid lands. (12) Why should there be more life in the tropical zone? (13) Name some of the plants living there. (14) Name some of the animals. (15) How do they protect themselves? (16) What can you say of the plants of the moist temperate zone? (17) Of the animals? (18) Of

the bison? (19) How does climate influence the cultivated crops? (20) The domesticated animals? (21) What cultivated plants and domesticated animals has North America supplied? (22) Describe the difficulties that the Eskimos encounter. (23) Give some examples of Indian names. (24) Describe the life of the savage and barbarous Indians. (25) Of the semi-civilized Aztecs. (26) What causes prevented the Indians from becoming more civilized? (27) Give a reason why the Aztecs were able to advance. (28) What winds aided Columbus to discover southern countries? (29) What advantage did their location in southern North America give the Spaniards? (30) How did the Spaniards treat the Indians? (31) What attracted the French to America? Where did they settle? (32) What other nations settled in the East? (33) What has been the fate of the Spaniards and French in America? (34) Why have the English-speaking people come into possession of the greater part of the continent? (35) What interfered with the westward migration of the English? (36) How was this migration finally brought about? (37) What effort has been made to care for the Indians? Why has it failed? (38) Tell about the beginnings of slavery in America. (39) Why was it more successful in the South than in the North? (40) What is the condition of the negroes now? (41) Where do our immigrants come from? (42) What is our mission toward them?

Suggestions. — (1) Examine some century and cactus plants. (2) Find some furniture made of mahogany or other tropical wood. (3) Visit a greenhouse to see orchids. (4) Collect pictures of native plants and animals of North America. (5) Collect samples of different American woods. (6) What does the eagle signify as our national emblem? On what coins is it found? (7) What have you read about the bison? About Indians? Write a story about each. (8) Explain more fully why domestic animals are necessary to civilized life. (9) Write a story about slavery times. (10) Do you know any of the negro melodies that were sung on the plantations?

For **References**, see page 439.

VI. LATITUDE, LONGITUDE, AND STANDARD TIME

Latitude and Longitude

Need of a Means for Locating Places. — You have doubtless noticed that it has frequently been necessary to refer to lines upon the earth, such as the Tropic of Cancer, the Equator, the Arctic Circle, etc., in order to locate certain places and the boundaries of the zones. But these lines are far apart, and there are many places between them to which reference must often be made. For instance, suppose we wished to state on what part of the earth London is situated; how could it be done? Of course, by taking a long time, it would be possible to describe just where this city is; but cannot some more convenient way be devised?

The difficulty is much the same as that which arises in a large city. There are thousands of houses in the city, as there are thousands of towns and cities in the world. No one person knows who lives in most of them, and if a stranger were looking for a friend, he might have much trouble in finding him.

The Streets of a City. — In this case the problem may be solved in a simple manner. A street running east and west may be selected to divide the city into two parts (Fig. 89). Any place north of this street is spoken of as being on the north side, and south of it as being on the south side. The streets to the north and south are numbered from

this, as North 1st, North 2d, North 3d; and South 1st, South 2d, South 3d, and so on. Then if a man says that he lives on North 4th Street, one knows immediately that he lives on the north side, and that his house is on the 4th street from this central one.

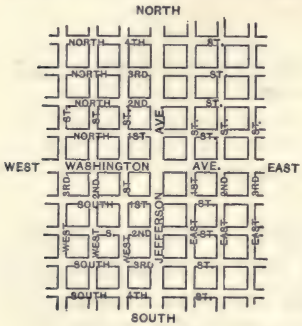


FIG. 89.

Map of a part of a city, to illustrate the need of naming streets.

But a city also extends a long distance east and west, and we need to know on what part of 4th street this house is to be found. To answer that question, another street running north and south, and crossing the east and west ones, may be selected to divide the city into east and west parts. The streets on the two sides are numbered from this one, as East 1st, East 2d, West 1st, West 2d, etc. (Fig. 89).

Then if a man lives on the corner of North 4th and East 3d streets, one knows not only that his home is *north* of a certain line, but *east* of another line. If the blocks, or the space between any two streets, are always the same, it will also be easy to tell the distance from each of the central streets to the house.

This plan is not necessary in small towns and villages, because the people there know one another, and are able to direct strangers easily. Few, if any, cities follow *exactly* the scheme here given; but many have a system of naming or numbering streets somewhat similar to this.

If you live in a large city, perhaps you can tell just how your streets are named or numbered.

Distance North and South of the Equator (*Latitude*). — Places upon a globe are located in much this manner. For example, the equator, which extends around the earth midway between the poles, corresponds to the dividing street running east and west. The distance between the equator and the poles, on either side, is divided into ninety parts (Fig. 90), corresponding, we might say, to the blocks in a city. These, however, are each about sixty-nine miles wide and are called *degrees*, marked with the sign °.

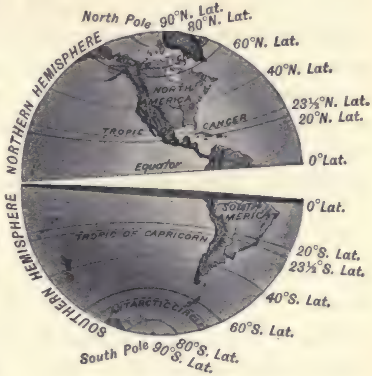


FIG. 90.

The globe, showing the two hemispheres and some of the circles of latitude.

In making maps people think of a line, or a circle, extending around the earth sixty-nine miles north of the equator, and called a *circle of latitude*. Any point upon it is one degree (1°) north of the equator, or 1° *North Latitude* (abbreviated to N. Lat.). Similar lines are imagined 2°, 3°, and so on up to 90°, or to the north pole.

Since all points on any one of these circles are the same distance from the equator, and from the other circles of latitude, the lines are *parallel;* and on that account they are called *parallels of latitude*. See a globe.

The same plan is followed on the south side, places in that hemisphere being in *South Latitude* (S. Lat.).

If one finds that a certain place is on the 8th, or the 50th, or some other parallel north of the equator, he

knows how far it is north of the equator. San Francisco is close to the 38th parallel, Chicago close to the 42d, and St. Paul on the 45th (Figs. 178 and 211). Knowing this, it is easy to see that Chicago is 4°, or about two hundred and seventy-six miles, farther north than San Francisco, while St. Paul is 3°, or over two hundred miles, farther north than Chicago.

Of course there are no marks *upon the earth* to show where these lines run, but they are of great use *on maps*, because they help us to locate places. Small maps and globes cannot well show the entire ninety parallels on each side of the equator, so that usually only every fifth or tenth one is drawn. Examine some maps (such as Figs. 95 and 178), to see which ones are given. Near what parallel do you live?

In speaking of the seasons (p. 34) it was stated that on June 21 the vertical rays of the sun reached farthest north. The part of the earth which they reach is $23\frac{1}{2}°$ north of the equator, and is marked on the maps by the Tropic of Cancer (Fig. 90). The Tropic of Capricorn is the same distance south of the equator (Fig. 90).

Knowing now the length of a degree, you can find the width of the tropical zone, both in degrees and in miles. What is it? New Orleans is just south of the 30th parallel N. Lat. How far is it from the tropical zone?

On the day that the vertical rays of the sun reach farthest north, the entire Arctic Circle is lighted by the sun at midnight. This circle is the same distance from the pole as the Tropic of Cancer from the equator, that is $23\frac{1}{2}°$. The Antarctic Circle is the same distance from the south pole.

From this it is evident that we can easily find the lati-

tude of a given place by the help of these parallels, for *latitude is the distance north or south of the equator.*

East and West Distances on the Earth (*Longitude*[1]). — But how about distance east and west? It is twenty-five thousand miles around the earth at the equator, and some means must be found for telling on the map how far places are from each other in these directions.

Imaginary lines are used for this purpose, as before; but this time they extend north and south from pole to pole (Fig. 91), and are called *meridians*, or lines of *longitude*. In the case of the city it makes little difference what north and south street is chosen from which to number the others. It is only necessary that a certain one be *agreed upon*.

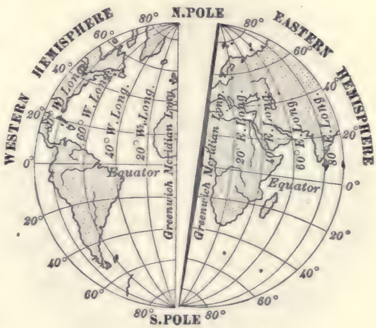


FIG. 91.

The earth, cut in halves along the Greenwich meridian, showing some of the meridians. The meridian 20° is usually considered the dividing line between the eastern and western hemispheres.

It is the same with these meridians. No one is especially important, as the equator is, and consequently different nations have selected different lines to start from. In France the meridian extending through Paris is chosen, in England that through Greenwich near London, and in America the one passing through Washington is sometimes used. But it is im-

[1] The ancients thought that the world extended farther in an east and west than in a north and south direction. Therefore they called the east and west, or *long* direction, longitude; the north and south direction, latitude.

portant that all people agree on some one, so that all maps may be made alike. On that account many countries start their numbering with the meridian which passes through Greenwich. The maps in this book follow that plan.

In Greenwich is a building, called an observatory, in which there is a telescope for the study of the sun, moon, and stars. As these heavenly bodies are of great help in finding the latitude and longitude of places, Greenwich seemed to the English a fitting place from which to begin numbering their meridians.

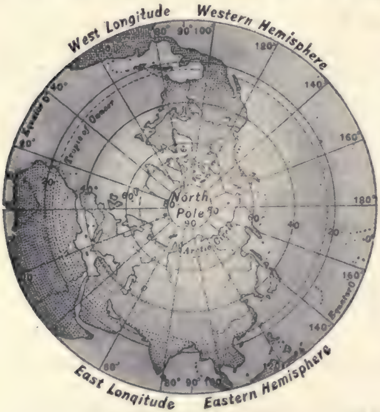


FIG. 92.

A view, looking down on the north pole, to show how the meridians come to a point at the north pole. Notice that if the 0° meridian were continued it would unite with the meridian 180°.

Commencing with this meridian as 0° longitude, people measure off degrees both east and west of it, and think of lines as extending north and south toward the poles, as they do of circles of latitude running parallel to the equator. Thus there is a meridian 1° west, another 2°, a third 3°, etc. Going eastward, they number 1°, 2°, 3°, in the same way.

Any place on the 3d meridian west of Greenwich is said to be in 3° *West Longitude* (W. Long.); if on the 60th meridian, 60° W. Long. Any place on the 20th meridian east of Greenwich is in 20° *East Longitude* (E. Long.). New York is 74° W. Long., while San Francisco is about 123° W. Long. Jerusalem is about 35° E. Long.

Knowing the latitude and longitude of any place, it

can, by the aid of a map, be as easily located as a house in a great city. For instance, Denver is about 40° N. Lat. and 105° W. Long. It is therefore far to the north and west of New Orleans, which is about 30° N. Lat. and 90° W. Long.

Find the latitude and longitude of some of the large cities on the map (Fig. 97). Notice also that only every fifth meridian is marked. Compare this with the map of New England (Fig. 99). Since this map represents a smaller section of country, more meridians can be drawn upon it.

The circles of latitude are parallel to the equator and to each other, as you can prove by measuring the distance between them on a globe. But the meridians cannot be parallel on a globe, since they start from the poles and spread farther and farther apart until the equator is reached. Examine some of the maps in this book to see that the meridians are not parallel, while the lines of latitude are.

FIG. 93.

An orange with a part of the peeling removed to show how the lines converge toward the poles, as the meridians converge on the globe.

You can see how this is by taking the peeling from an orange (Fig. 93). The edges of each of the quarters spread far apart in the middle, or equator, but come together at the ends, or poles, of the orange.

A degree of longitude is a little over sixty-nine miles at the equator; but it decreases more and more as the poles are approached, until at the poles it is nothing, because all the meridians meet there at one point. Examine Figure 92 or, better still, a globe, to see that this must be true.

Standard Time

If you were to travel from New York to San Francisco, you would find on arriving there that your watch was three hours ahead of the clocks in that city. The reason is that the rotation of the earth, from west to east, causes the sun's rays to fall upon the Atlantic coast more than three hours sooner than upon the Pacific, so that when it is noon in New York, it is about nine o'clock in the morning at San Francisco.

Measuring from east to west, every place has a different time by the sun, and some years ago each city had its own ***sun*** or ***solar*** time. But when railways were built, connecting many places, these differences became a source of constant annoyance to the traveller. As his watch showed the time of only one place, perhaps a city some distance to the east or west, he could not tell exactly when a train would leave, or when his meals would be served.

In order to avoid all this trouble the continent has been divided into belts, in each of which all the railways, and most of the towns, have the same time. Since this time is the *standard for all*, these belts are called the *Standard Time Belts.* The one in the extreme east is called the *Colonial Belt;* that next west of it, which includes New England, New York, and some of the other Eastern states, is called the *Eastern Time Belt.* What are the names of the others? (Fig. 94.)

In travelling across the country from New York to San Francisco, one starts with his watch set at the standard time for the Eastern Time Belt. After a while he comes to a place where the time changes one full hour; then he has Central Time. Going still farther west to the Moun-

tain Belt, the watch is again set back one full hour; what is done when the Pacific Belt is reached? In this way, only a few changes of the watch have to be made; and, as long as one remains in a certain belt, he is sure of the time of day.

Our study of longitude helps us to understand what determines the places for changing this time. When the

STANDARD TIME IN THE UNITED STATES.

FIG. 94.

To show the standard time belts of the United States, — the actual boundaries being irregular, as you see.

sun is rising at a certain point on a meridian, it is rising at every other point on that meridian.[1]

The earth makes one complete rotation every 24 hours, so that sunrise, noon, and sunset reach each of the 360 meridians in the course of the day of 24 hours. Dividing 360 by 24 gives 15; that is the number of meridians that

[1] It is understood, of course, that this does not apply to the frigid zone, where the sun does not rise at all during a part of the year, and where it does not set during another part of the year.

the sunrise or sunset pass over in a single hour. Therefore, if in one place, as at Philadelphia, on the 75th meridian, it is sunrise at six o'clock, it will be sunrise one hour later at all points just 15° west of this, or on the 90th meridian.

This explains what has determined the boundary lines of the time belts. The time selected for the Eastern Belt is that of the 75th meridian; for the Central Belt, that of the 90th meridian, which is just one hour later. What meridian is selected for the Mountain Belt? (Fig. 94.) For the Pacific Belt? Each of these meridians runs through the *middle* of the belt whose time it fixes, so that the eastern boundary of the Central Time Belt is half-way between the 75th and 90th meridians, that is West Longitude $82\frac{1}{2}°$; and the western boundary is half-way between the 90th and 105th meridians, or $97\frac{1}{2}°$ West Longitude.

In reality the railways do not change their time *exactly* according to these boundaries, for oftentimes the meridians extend through very unimportant points, or even cross the railways far out in open country. Instead of following the exact boundaries, they select well-known places, like Buffalo, Pittsburg, and Atlanta, at which cities the change is made from Eastern to Central time. Therefore, the boundaries which represent the places where the railways *actually* change their time are somewhat irregular, and not always on the proper meridian (Fig. 94).

You see that the object of these Time Belts is to save annoyance, and that *for most places the standard time is incorrect time.* For instance, noon by the standard time is not the real noon for any places in the United States excepting those along the 75th, 90th, 105th and 120th meridians.

QUESTIONS: *Latitude and Longitude.* — (1) How may an east and west street be used in a city to locate houses? (2) How may a north and south street be so used? (3) Make a plan of a city showing two central streets and others numbered from them. (4) What corresponds to the central east and west street in locating places upon the globe? (5) Into how many parts is the distance between the equator and each pole divided? (6) What is each of them called? (7) What is meant by saying that a place is in 1° N. Lat.? (8) How far apart are the circles of latitude? (9) Why are these circles called parallels? (10) What is S. Lat.? (11) Give the latitude of each of the tropics. (12) Of the Arctic and Antarctic circles. (13) What is a meridian? (14) Why is it necessary to have them upon maps? (15) Which meridian is most commonly chosen as zero? Why that one? (16) How high do the numbers of the meridians run? (Fig. 360.) (17) What is meant by saying that a place is in 3° E. Long.? In 90° W. Long.? (18) Show that meridians are not parallel.

Standard Time. — (19) Explain why the time is continually changing as one goes west. As he goes east. (20) How has this caused annoyance in travelling? (21) What remedy has been found? (22) What are the names of the Standard Time Belts in the United States? (23) What is the difference in time between the belts? (24) Which meridians are used to fix the boundaries? Why these? (25) Show the boundaries on the map (Fig. 94). (26) Why is standard time really incorrect for most places?

SUGGESTIONS. — (1) Find how the streets of Washington have been numbered and lettered. (2) What is the width, in degrees and miles, of the north temperate zone? (3) What is the latitude and longitude of Boston? Of Washington? Of Chicago? Of your nearest large city? (4) Find some cities that are on or near the 42d parallel of latitude. (5) What place is in 25° N. Lat. and 81° W. Long.? Near 40° N. Lat. and 75° W. Long.? (6) Make a drawing showing several of the meridians. (7) Visit a telescope and look through it. (8) Find the 100th meridian (on map Fig. 97) west of which much of the country is arid. (9) Compare some of the parallels of latitude with the nearest isotherm (Fig. 63). (10) Where and how much would you change your watch in travelling from San Francisco to Chicago? (11) What is the difference in time between Baltimore and Denver? (12) Examine some railway time-tables to see how they indicate the changes in time. (13) What is the difference where you live between Standard Time and solar time?

VII. THE CONTINENT OF NORTH AMERICA

THE relief map, Fig. 5, and the map, Fig. 95, show the great Western highlands, the lower highland region of the East and the great trough between. What are the names of the large rivers that drain the different sections? In which direction does each flow, and into what waters does each empty? In what part are most of the lakes found? Why? Name and locate each of the large peninsulas, islands, bays, gulfs, and seas. Draw an outline map of the continent. Upon it locate the large cities.

This great mass of land is under the control of different nations. The Dominion of Canada is a British colony and so are Newfoundland and Labrador, and some of the islands south of the United States. Name them. Greenland and Iceland are Danish colonies; but the countries of Central America, Mexico, and the United States are independent nations. The United States also includes Alaska, the island of Porto Rico, and some islands of the Pacific. In addition to this, Cuba is under our protection. What is the name of the group of islands to which Cuba and Porto Rico belong?

We have already learned many facts about the continent; but now, in order to study it further, we shall need to take it up section by section. In doing this we begin with the United States, the most productive and most densely settled part of the continent.


NORTH AMERICA
Scale of Miles.
0 500 1000
Capitals: ⊙ Other Cities: •
ARCTIC OCEAN
PACIFIC OCEAN
ATLANTIC OCEAN
ASIA
GREENLAND (To Denmark)
ICELAND
ALASKA
DOMINION OF CANADA
UNITED STATES
MEXICO
CENTRAL AMERICA
SOUTH AMERICA
WEST INDIES
Hudson Bay
Baffin Bay
Davis Strait
Gulf of Mexico
Caribbean Sea
LABRADOR
NEWFOUNDLAND
NOVA SCOTIA
Comparative Area
PENN.
45,215 Square Miles.
100° Longitude West 90° from Greenwich 80°
THE M-N. CO.

FIG. 95.

Part II

THE UNITED STATES

The climate and physiography of the United States vary greatly from place to place. What are some of the differences of climate? Draw a sketch map to show the isotherms for January (Fig. 63, p. 72). For July (Fig. 64). Draw a map also to show the rainfall (Fig. 46). Draw another map to show the plant zones (Fig. 65).

Study the relief map carefully (Fig. 98) to see the areas of plains, plateaus, and mountains. What is the name of each division? (Fig. 96.) On a sketch map of the United States write the names of the different physiographic divisions in their proper places (as in Fig. 96). Could you not make a sand or clay model of the United States, showing, in a general way, the greater highlands and lowlands?

Our country is so large, and so different in the various parts, that in order to study it in detail we must divide it into sections. The state boundaries might serve as a means of thus dividing the country; but there are far too many of them. How many states are there? Draw a sketch map of the country, and place upon it the boundaries and names of all the states. What is a state? (See First Book, p. 94.) Find out about your own state: its

government, its capital city, the name of the governor, and other important facts.

In studying the different states it is convenient to group them into five sections and study each group by itself. The first states selected for this study will be the six in the northeastern part of the country, which are commonly

Fig. 96.

Physiographic map of the United States, giving the names of the principal mountains, plateaus, and plains.

called the New England States. As you study each of these groups of states, a very important point to notice is the scale upon which the map is drawn. It is impossible to have all maps on the same scale — for instance, North America and the United States. One of the points that geography teaches is how to understand maps of different scales.

For References, see page 439.


125°
120°
115°
110°
105°
Longitude 100° West from 95°
45°
40°
35°
30°
25°
DOMINION OF
Vancouver
Victoria
C. Flattery
Regina
Winnipeg
WASHINGTON
Seattle
Olympia
Tacoma
Mt. Rainier
Spokane
Portland
Columbia R.
Mt. Hood
Salem
Cascade Mts.
OREGON
MONTANA
Rocky
Missouri R.
Helena
Butte
Yellowstone R.
NORTH DAKOTA
Bismarck
Fargo
Red R.
MINNES
Minneapol
IDAHO
Boise
Snake R.
YELLOWSTONE NATIONAL PARK
WYOMING
Deadwood
Black Hills
Pierre
SOUTH DAKOTA
Sioux Falls
Sioux Cit
Mt. Shasta
C. Mendocino
Sacramento R.
Coast Range
Sierra Nevada
CALIFORNIA
Sacramento
San Francisco
Yosemite Valley
San Joaquin
Mt. Whitney
Tulare L.
Pt. Conception
Los Angeles
San Diego
NEVADA
Virginia
Carson City
Great Salt Lake
Ogden
Salt Lake City
Wasatch Mts.
UTAH
Cheyenne
NEBRASKA
Platte R.
Omaha
Lincoln
Missouri R.
Grand Jc.
Denver
Leadville
COLORADO
Pikes Peak
Pueblo
Kansas City
Topeka
KANSAS
Arkansas R.
Grand Canyon
Colorado R.
San Francisco Mt.
ARIZONA
Phœnix
Gila R.
Tucson
Santa Fé
Albuquerque
NEW MEXICO
Pecos R.
Canadian R.
OKLAHOMA
Guthrie
Arkansas
INDIAN TERRITORY
Red R.
Brazos R.
Dallas
TEXAS
Austin
Houston
San Antonio
Rio Grande
MEXICO
LOWER CALIFORNIA
Gulf of California
PACIFIC OCEAN
GU
Longitude 100° West from 95°

FIG. 97.


UNITED STATES
Scale of Miles.
0 50 100 200 300
Capitals of Countries
Capitals of States
Other Cities
95° Greenwich
90°
85°
80°
75°
70°
65°
45°
40°
35°
30°
25°
CANADA
L. Superior
L. Michigan
L. Huron
L. Ontario
L. Erie
Lake of the Woods
Duluth
Sault Ste. Marie
Ottawa
Montreal
Quebec
Fredericton
Toronto
Niagara Falls
MAINE
Augusta
Portland
MT. DESERT I.
VERMONT
Montpelier
N. HAMP.
Concord
MASS.
Boston
C. Cod
Providence
Newport
CONN.
Hartford
New Haven
LONG I.
NEW YORK
Adirondack Mts.
Saratoga Sprs.
Albany
Rochester
Buffalo
Catskill Mts.
New York
Trenton
Camden
Atlantic City
PENNSYLVANIA
Erie
Pittsburg
Harrisburg
Philadelphia
Baltimore
Annapolis
Dover
DEL.
Washington
W. VIRGINIA
Wheeling
Charleston
VIRGINIA
Richmond
Petersburg
Norfolk
Chesapeake Bay
James R.
Potomac R.
Appalachian Mts.
Mt. Mitchell
NORTH CAROLINA
Raleigh
Wilmington
C. Hatteras
SOUTH CAROLINA
Columbia
Charleston
GEORGIA
Atlanta
Savannah
Savannah R.
FLORIDA
Tallahassee
Jacksonville
St. Augustine
Tampa
C. Sable
Key West
ATLANTIC OCEAN
BAHAMA ISLANDS
Havana
CUBA
GULF OF MEXICO
MICHIGAN
Grand Rapids
Lansing
Detroit
Toledo
Cleveland
OHIO
Columbus
Cincinnati
Ohio R.
INDIANA
Ft. Wayne
Indianapolis
Evansville
KENTUCKY
Frankfort
Louisville
Mammoth Cave
Cumberland R.
TENNESSEE
Nashville
Chattanooga
Memphis
Tennessee R.
ALABAMA
Montgomery
Mobile
Alabama R.
Chattahoochee R.
MISSISSIPPI
Vicksburg
Jackson
LOUISIANA
Baton Rouge
New Orleans
Red R.
Sabine R.
Mississippi R.
Galveston
ARKANSAS
Little Rock
Fort Smith
Arkansas R.
MISSOURI
Jefferson City
St. Louis
Kansas City
Ozark Mts.
Cairo
ILLINOIS
Chicago
Peoria
Springfield
Wabash R.
WISCONSIN
Milwaukee
Madison
St. Paul
MINNESOTA
IOWA
Des Moines
Sioux City
THE M.-N.CO.

FIG. 98.

Relief map of the United States. Describe the relief of the country.

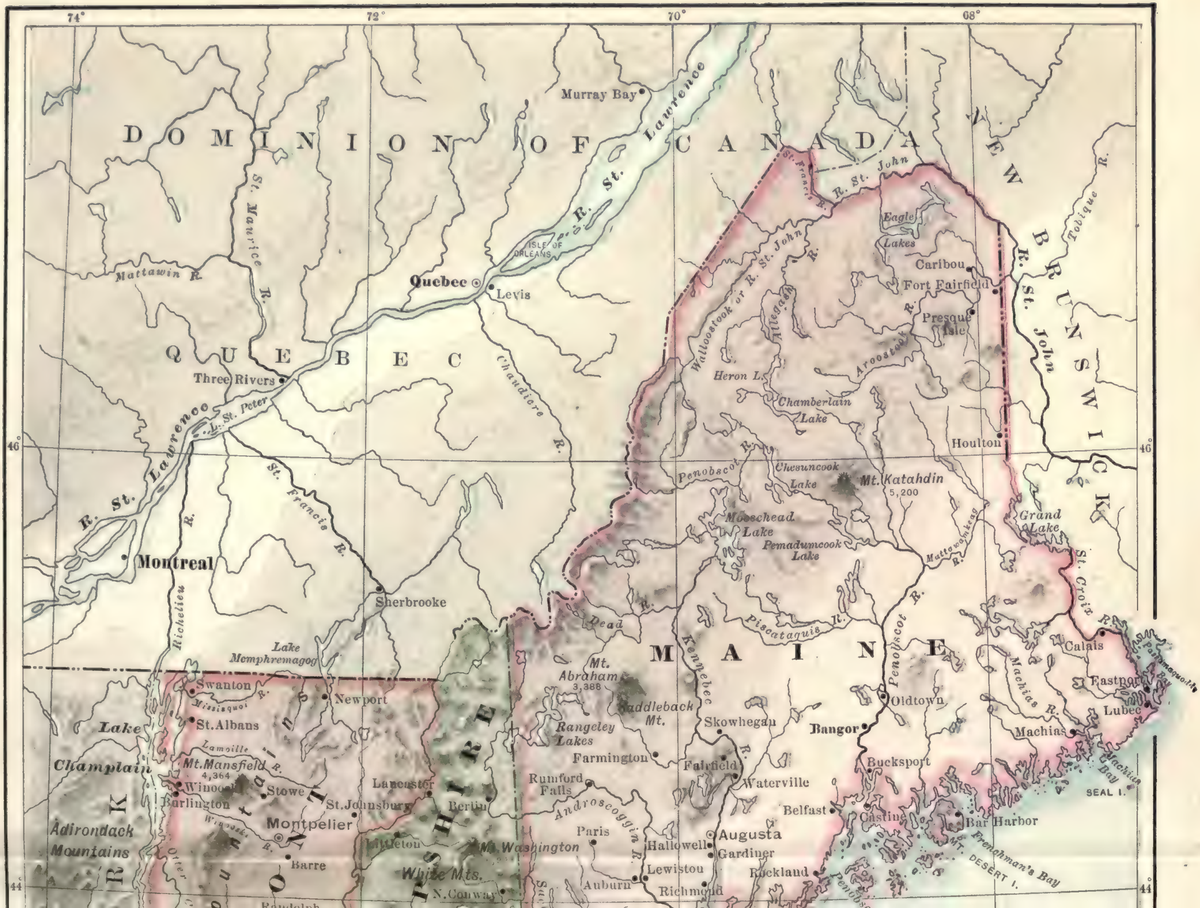
VIII. NEW ENGLAND

MAP QUESTIONS. — (1) Name the states of this group. (2) What is the capital of each? (3) Where are the mountains? (4) Into what bay does the Penobscot River flow? (5) What large island just east of it? (6) Find three large lakes. In which state is each? (7) Where are the largest cities? Why there? (8) What cape about twenty-five miles north of Boston? (9) What cape southeast of Boston? (10) Find Massachusetts Bay. (11) Find Cape Cod Bay. (12) What two large islands lie south of Massachusetts? (13) What two bays near them? (14) What large island lies south of Connecticut? (15) In what state is it? (See Fig. 121.) (16) What waters separate it from Connecticut?

FIG. 100.

One of the many New England lakes formed by the great glacier.

Physiography. — Many facts in regard to New England are already familiar from what has been said in Part I. The sinking of the coast has made the shore line extremely irregular, thus forming many fine harbors. The great glacier, that came down from the north, has left its traces


74°
72°
70°
68°
46°
44°
DOMINION OF CANADA
QUEBEC
NEW BRUNSWICK
MAINE
Murray Bay
R. St. Lawrence
Isle of Orleans
Quebec
Levis
Three Rivers
L. St. Peter
R. St. Lawrence
Montreal
Sherbrooke
St. Maurice R.
Mattawin R.
Chaudiere R.
St. Francis R.
Richelieu R.
Lake Memphremagog
St. Francis R.
R. St. John
Eagle Lakes
Caribou
Fort Fairfield
Presque Isle
Aroostook R.
Walloostook or R. St. John
Allegash R.
Heron L.
Chamberlain Lake
Houlton
Tobique R.
R. St. John
Chesuncook Lake
Mt. Katahdin
5,200
Penobscot R.
Moosehead Lake
Pemadumcook Lake
Mattawamkeag R.
Grand Lake
St. Croix R.
Dead R.
Piscataquis R.
Kennebec R.
Penobscot R.
Calais
Passamaquoddy Bay
Eastport
Lubec
Machias R.
Machias
Machias Bay
SEAL I.
Mt. Abraham
3,388
Saddleback Mt.
Rangeley Lakes
Farmington
Skowhegan
Bangor
Oldtown
Bucksport
Fairfield
Waterville
Rumford Falls
Androscoggin R.
Belfast
Castine
Bar Harbor
Frenchman's Bay
MT. DESERT I.
Paris
Augusta
Hallowell
Gardiner
Rockland
Lewiston
Auburn
Richmond
Swanton
Missisquoi R.
Newport
St. Albans
Lamoille R.
Mt. Mansfield
4,364
Winooski
Stowe
Burlington
Lancaster
St. Johnsbury
Berlin
Montpelier
Barre
Littleton
Mt. Washington
White Mts.
N. Conway
Lake Champlain
Adirondack Mountains
Otter

NEW ENGLAND STATES
Scale of Miles.
0 25 50 100
Cities with over 1,000,000: New York
Cities with 500,000 to 1,000,000: Boston
Cities with 200,000 to 500,000: Montreal
Cities with 50,000 to 200,000: Portland
Cities with 25,000 to 50,000: Holyoke
Smaller Places: Rutland
Capitals with less than 25,000: Augusta
State Capitals:
Other Cities:
MASSACHUSETTS
CONNECTICUT
RHODE ISLAND
NEW HAMP
VERMO
NEW YORK
Boston
Portland
Lowell
Lawrence
Worcester
Springfield
Hartford
New Haven
Providence
Fall River
New Bedford
Bridgeport
Albany
Concord
Manchester
Massachusetts Bay
Cape Cod Bay
Long Island Sound
LONG ISLAND
New York
ATLANTIC OCEAN
Longitude West from Greenwich
72°
70°
68°
42°
44°
THE M.-N. CO.

Fig. 99.

FIG. 101.

Relief map of New England. Describe the relief: (*a*) the location of the mountains, (*b*) the lowlands, (*c*) the lakes, (*d*) the drainage, (*e*) the nature of the coast line.

everywhere. By damming the streams and turning them from their courses, it has caused many lakes, falls, and rapids (Fig. 100). The rocky surface of the country, with bare ledges and boulder-strewn soil, and, indeed, the very soil itself, have also been caused by the glacier. For many years the edge of the ice sheet extended along the southern margin of New England; and the moraine hills and sandy plains that it piled up now cover much of Cape Cod, Martha's Vineyard, Nantucket Island, and Long Island.

While low near the coast, the land rises rapidly toward the north and west, and soon becomes a plateau crossed by river valleys whose bottoms are several hundred feet below the plateau top. The upland near the coast has been so cut by many valleys that the surface is studded with low hills. But in the west, the higher upland, known as the Berkshire Hills, is quite mountainous.

Other mountains, in some cases where the rocks are hard, rise above the plateau. Some of these, like Mt. Monadnock in southern New Hampshire (Fig. 102), rise singly; others, like the White Mountains of New Hampshire (Fig. 103), are in groups; and still others, such as the Green Mountains of Vermont and the continuation of the White Mountains across northern Maine, form irregular ranges. Many of the mountain peaks reach from three thousand to four thousand feet above sea-level; but Mt. Washington in New Hampshire is more than a mile in height, and Mt. Katahdin in Maine (Fig. 118, p. 152) rises to a height of nearly a mile.

The upland, or plateau, of southern New England is called a *peneplain*, a word meaning *almost a plain*. It represents a region of ancient mountains planed down to their very roots, then uplifted and cut by the rivers into its present irregular form.

The mountains, and parts of the plateau, are too rough and rocky for much farming, so that this industry is mainly confined to the valleys; but the scenery in this rugged region is magnificent. Describe some of the views that you would expect to see. Make an outline map showing the important rivers and lakes represented on Figure 99. Describe the location of each. Be ready to draw the map from memory.

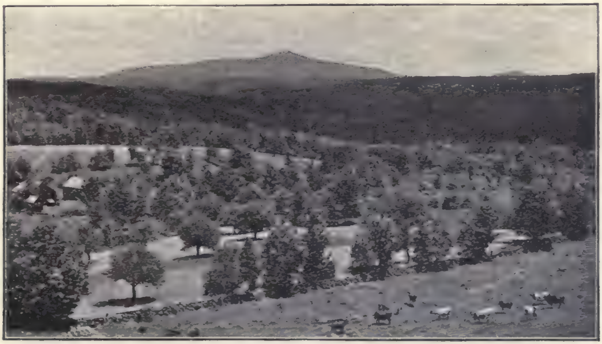


FIG. 102.

A view across the upland of New England, with Mt. Monadnock rising in the background. Describe this view.

Climate. — New England is so far north that its climate is cold in the northern part and the snows are heavy. This coldness is increased by the Labrador current, which makes the east winds cool in summer, and damp and chilly in winter. On the other hand, since the Gulf Stream (Fig. 59, p. 65) flows about a hundred miles from the coast of southern New England, that section has warm south winds and little snow in winter.

THE FORESTS

Cutting the Timber. — In the days of the early settlers there was so much forest in New England that lumber was one of the first products sent back to England. Now,

where the soil is fertile, most of the woods have been cleared away ; but large sections in northern Maine, New Hampshire (Fig. 103), and Vermont, as well as parts of the three southern states, are still covered with timber. Standing on the summit of Mt. Katahdin (Fig. 118), for instance, one sees only a vast wilderness of trees in all directions. The nearest cultivated land is twenty-five miles to the east; but the forests stretch much farther away to the north and west.

FIG. 103.

The forest-covered slopes of a portion of the White Mountains of New Hampshire.

Winter is the busy season in this wilderness, for at that time men go into the forests to cut the timber. Lumbering in Maine is an interesting occupation, but it involves so many hardships that a lumberman is said to become an old man after a few years of service.

It is often necessary to work when the temperature is far below zero. The swamps, which are numerous, and in summer almost impassable, are then frozen. At that season, also, the

snows have levelled over the boulders and fallen trees so that heavy sleds, loaded with logs, may be drawn through the woods.

Usually fifty men or more are necessary to a logging camp. With axes in hand, they go through the woods, cutting all the trees that are large and sound enough for good lumber. These are cut down, the limbs chopped off, and the logs dragged by horses to the banks of the nearest stream. The men go forth early in the morning and work until late in the evening, eating and sleeping in log cabins (Fig. 105). Their beds are broad shelves of rough boards covered with boughs from the spruce and balsam trees, and the camp is often so small that they must lie side by side with scarcely room to turn.

FIG. 104.
Lumbermen in the Maine woods.

Floating the Logs to the Mills. — When the snow melts in the spring, the cutting is over and another busy season begins. The logs that are ready are whirled away by the stream current, now swollen by the melting snows; but frequently even this flood of water is not sufficient to carry them. To provide against that difficulty, dams are placed across the streams, or at the outlet of lakes, to store

water for use when needed. Immense numbers of logs are floated, or "driven," down stream, forming what the lumbermen call a "log drive."

The work of driving the logs down stream is a very exciting one. Rocks and shoals often check them in their course; and, as soon as one gets caught, others are held back by it, so that, if the jam is not speedily removed, the entire stream may soon become blocked, and all the logs above be prevented from floating down. Such a condition is called a *log jam* (Fig. 105), and it is the business of the men to prevent it by keeping the logs moving along in the river, and by freeing any that may become lodged. To do this, they must often wade into the icy water and ride upon the logs. It is common to see a man glide along on a single log, clinging to it by means of the sharp spikes in his boots, balancing himself with a long pole, and jumping from log to log, as a squirrel springs from tree to tree. The men are often wet from head to foot, and sometimes one is thrown into the water and drowned.

Sawmills and Paper-mills. — Some of the logs are stopped near waterfalls far up stream and there sawed into boards, laths, shingles, etc.; but most of them are carried as far as the current will take them, even down to the river mouths. These places are natural sites for large towns and cities, because there the logs must be changed to lumber and various articles, which require much work and many men.

Where the current of the Penobscot will carry the logs no farther, that is, where the ocean tide checks the river current, the large city of BANGOR has grown up, since ocean vessels may come to this place to carry off the lumber (Fig. 105). The drives of the Kennebec and Androscoggin are stopped at the sawmills in several cities along those rivers, such as WATERVILLE, and AUGUSTA, the

FIG. 105.

A group of small pictures to illustrate lumbering. A and B show logging camps; in D logs are being drawn to the frozen stream; E and F are pictures of two log jams; and C shows a vessel loading lumber from the piles of boards on the wharf near the sawmill.

capital; but some are carried down as far as BATH, which is noted for its ship building. On the wharfs of PORTLAND, the largest city in Maine, are immense quantities of boards ready to be shipped away to be made into boxes, barrels, doors, and hundreds of other articles.

Another important use of forest trees is to make paper, for much of the paper commonly seen — as newspaper and wrapping paper — is now made of wood. Short logs (two-foot lengths) after having the bark removed are placed in a steel enclosure and forced against an enormous grindstone. The *pulp* thus ground off is carried away by water, run through a sieve, and compressed into thin sheets between rollers. When dry it is paper ready for the market. One does not often think when reading the news, or wrapping a package, that the paper in his hands may once have been part of a live tree in the forest, perhaps in the woods of Maine.

Paper-mills are found at BANGOR, AUGUSTA, and other cities in New England. However, HOLYOKE, the greatest paper-making city in New England, is situated far away from the forests in the midst of busy cities in Massachusetts. There the pulp is generally made of rags, which produce a finer grade of paper. The neighboring cities guarantee a large supply of the necessary rags.

Maple Syrup and Sugar. — Among the trees in the forests of northern New England is one kind called the *sugar maple*. It is very common in Vermont, although it grows in many other states also, as in New York, Pennsylvania, and Ohio. Its sap, unlike that of most trees, is sweet; and if one bores a hole through the bark in early spring, when this liquid is moving through the trees most rapidly, it will ooze forth.

Men secure the sap by boring into the trees, inserting spouts in the holes, and catching the fluid in pails; and some farmers have regular sugar maple groves. The sap is changed into maple syrup and sugar by boiling, which causes evaporation of the water. On some farms there are special buildings, fitted out with evaporating pans, where syrup is made and bottled for sale. Near these are sugar maple groves; but in many cases the boys and men go into the woods for the sap.

The Rocks

There are three kinds of stone that are especially valuable in New England, namely, granite, marble, and slate, each of which is quarried in large quantities.

Granite. — Many of the hills and even mountains, such as Mts. Washington and Katahdin, are almost solely granite; but this is not often quarried, because it is too difficult to draw the heavy stone from the mountains to

Fig. 106.
A granite quarry near Gloucester, Mass.

places where it is needed. The quarries have generally been located close to cities, or near the sea where the stone may be cheaply sent away by ship. One of the oldest quarries in the country is at Quincy, near Boston (Fig. 117), and buildings made of Quincy granite over two hundred years ago may still be seen in Boston. Other quarries are found in and near Gloucester, Massachusetts, at Concord, New Hampshire, and along the coast of Maine.

Beds of stone have cracks, called *joints*, extending through them. These aid greatly in quarrying; for, in splitting out

large blocks, the quarrymen need only to drill holes, and then, with gunpowder, blast or break the granite from one joint to the next. Smaller pieces are obtained by drilling holes into the large blocks and breaking them apart by driving in wedges.

Since the stone is so heavy, derricks are used to move it about (Fig. 106). As more and more stone is removed, the quarry becomes a deep and open pit, from the bottom and sides of which the stone is blasted out.

Much of the granite is used for paving-stones in the city streets, where heavy wagons are constantly passing. For that purpose, large blocks are split into halves, these into smaller halves, and so on until the proper size is reached. Other large blocks are loaded into boats at the wharf and carried to Boston, New York, or even as far as New Orleans, where they are used as curbstones, blocks for buildings, and for other purposes. Several of the government buildings at Washington are made of New England granite.

One of the principal uses of granite is for monuments, columns, and other ornamental work. The stone is well suited for this purpose because of its beautiful color, which varies in different quarries, being gray, almost white, bluish, or distinctly red.

For ornamental work it is often given a polish. After being chipped as smoothly as possible with chisels, the stone is placed in a frame and then further smoothed by grinding sand or crushed steel against it by machinery. Finally, by grinding it with other hard substances of finer grain, it is made still smoother, like glass, and thus given a bright polish.

Statues, bunches of grapes and other ornamental forms, are cut out of this hard rock merely by chisel and hammer, the workmen chipping off bits here and there until the desired form is chiselled out.

Marble. — This stone is so much softer than granite that it may be sawed without being blasted. The most noted marble quarries in this country are near RUTLAND, Vermont, where much of the stone is white, though some of it is streaked with blue. In other places, as in Tennessee, the colors are different and often very beautiful.

Marble is too soft for paving stones, but is much used for buildings, statues, and monuments, the Rutland marble

FIG. 107.

A view in one of the marble quarries near Rutland, Vermont. Notice the derricks, by the aid of which the heavy blocks are raised out of the deep pits. Some of the large blocks are also seen.

being one of the most common headstones in the cemeteries of the East. Like granite, it may be given a high polish. Some of the most highly prized marble is so banded and variegated that, when polished, it makes a beautiful ornamental stone for interiors of cathedrals and public buildings.

White marble has been used for many centuries for making fine statues; in fact, long before the time of Christ, the Greeks built the marble Parthenon upon the Acropolis of Athens, and cut marble statues, such as that of the Venus of Melos, which have become famous on account of their marvellous beauty.

Slate. — Slate rock is quarried in several parts of New England, as in eastern Maine and western Massachusetts and Vermont. It is also obtained in Pennsylvania. The value of slate is due largely to the fact that it splits, or cleaves, so easily that it is readily broken into thin slabs with a smooth surface. In this way it is made into roofing slate and school slates; from it also are made slate pencils, slabs for wash basins, etc.

Fishing

Still another raw product of New England is fish. When the country was first settled, great numbers of various kinds, especially mackerel, halibut, and cod, were found close to the shore. Such names as Cape Cod, Halibut Point, and Bass Rock, given to places on the coast, indicate this. Find the first of these. PROVINCETOWN, on this cape, is still engaged in the fishing industry.

Fish supplied the first settlers with one of their chief foods, and the fishing industry soon became of importance. You will remember (p. 98) that it was the fishing which first attracted the French to the American coast; and they still retain the right to fish along the Newfoundland shore.

Near the coast, fish are now much less abundant; but since they are still found farther from the shore, hundreds of vessels and thousands of men are engaged solely in catching them. GLOUCESTER, which is a centre for that industry, is the greatest fishing port in the United States (Fig. 108); but BOSTON and PORTLAND also have an important fish trade.

Mackerel. — Mackerel are obtained in spring and summer. They swim together, and in such numbers — in *schools*, as fishermen say — that they make a great commotion in the water. The fishermen, who are cruising about in search of the fish, sail in swift, two-masted vessels, called *schooners*. When they sight a "school," they spring into their great seine boats, drop a large *seine*, or net, into the water, and endeavor to draw it around the "school." Then the seine is drawn in, forming a pocket and entrapping the fish. In this pocket enough fish are

FIG. 108.

A view in Gloucester harbor, showing the fishing schooners, the wharves where the fish are landed, and the buildings in which they are stored.

sometimes obtained to fill hundreds of barrels. Some are sold fresh, others are salted and sold as salt mackerel.

Halibut and Codfish. — The method of fishing described above is similar to that which the Disciples of Christ used in the Sea of Galilee. But fishing for halibut and cod is very different. This is carried on in winter as well as summer, and the vessels go from Gloucester even as far as Greenland and Iceland, although most of them fish off the New England and Newfoundland coasts.

Halibut are very large, often weighing more than a

man; and they are often caught upon single lines. Codfish may be captured in the same manner, though a *trawl* (Fig. 109) is more commonly used for cod than for halibut. The trawl consists of a number of hooks hanging from a single long line, all lowered into the water together and left there for hours. The fish bite at the suspended hooks, and in this way many are caught at one time.

This kind of fishing is dangerous because the men must venture out in small, flat-bottomed boats, called *dories*, to take the fish off the trawls. While they are busy a storm may arise, or a heavy fog come up, and prevent their return to the vessel.

FIG. 109.

Cod fishing by means of a trawl. Tell what you see in this picture.

They are then left in open boats far out upon the ocean. Every year dozens of Gloucester fishermen are lost in this manner.

As in the case of mackerel, codfish are sold either fresh or salt. In order to salt, or *cure* them, they are split open and cleaned, soaked in barrels of brine, and then dried upon the wharf. Sometimes the bones are removed, the skin stripped off, and the flesh torn into shreds and packed into boxes as boneless cod. Either the salted or boneless cod may be seen in almost any grocery, and much of it comes from Gloucester.

Other Ocean Foods. — Traps, or *weirs*, are also set for fish. They are placed along the shore, and many kinds of fish, such as shad, salmon, and bass, swim into them and are then unable to find their way out. *Lobster* fishing is also carried on, especially on the coast of Maine. A lobster trap, made of wood and weighted with stone, is lowered to the bottom, where the lobster lives, crawling around among the rocks and seaweed. A fish head for bait is inside the trap, and the lobster crawls in to get it; but he is so stupid that he is rarely able to find his way out.

FIG. 110.

A fish weir at Bar Harbor, Maine. The large buildings are summer hotels.

Clams, found along many parts of the New England coast, live buried in the mud flats which are exposed to view at low tide. At such time boys and men dig these shell fish out, as a farmer digs potatoes from a hill.

AGRICULTURE

So much of New England is hilly or mountainous, and so strewn with boulders, that farming is not so extensive an industry as in many other parts of the country. By no means all the food that is needed can be raised in this section, much grain and meat having to be brought from the Mississippi Valley. And since the southern portion of New England is thickly dotted with cities, where the people are engaged in other occupations, there is a ready market for whatever food the farmers can supply.

Each farm usually has a small orchard and produces hay and grain which are fed to cattle and horses, or sold near by. All the farmers keep a few hens and sell the chickens and eggs, and some make a business of raising hens, turkeys, and ducks. One of the occupations of the farmers is *truck farming*, which means that various kinds of vegetables, as tomatoes, sweet corn, potatoes, cucumbers, cabbages, and celery, are carefully cultivated, and these, together with milk and eggs, are sent to the nearest town to be sold. The farmer often takes them

FIG. 111.

A view on a Massachusetts farm, showing some fine breeds of milch cows.

himself and sells them from house to house, thus securing higher prices than if he sold them to a storekeeper. Why?

Strangers travelling through New England, upon seeing the hilly surface and rocky soil, are often puzzled to understand how, from such small farms, the owners can earn enough to build such large houses and barns, to furnish their homes so well, and to have so many books and pictures. But the excellent markets in the cities near at hand afford the explanation.

Where the farms are so far away from the cities that it is impossible to drive to them, the profits are less; but special arrangements are made for the marketing of milk. So much of this is needed in the large cities that special cars, carrying nothing but cans of milk, are run from far out in the country. Also a great deal of milk is made into butter and cheese, sometimes on the farm, but much more commonly at factories, or *creameries,* where the work is done by machinery.

FIG. 112.

A New England farmhouse and barn.

In some parts of New England, where the soil is very poor and no market is near, farming has been so unsuccessful that many farms have been abandoned, orchards are grown up with weeds, and houses and barns are tumbling down. This is especially true in the more hilly parts of New England.

Manufacturing

When the Puritans settled New England it was very expensive to bring from over the sea the articles that they needed. Nevertheless, at first they imported not only furniture and tools, but even wood for the interior of houses and bricks for the walls, fireplaces, and chimneys. Even now, in some of the older New England

buildings, one sees doors and rafters that came from across the ocean many generations ago.

Very soon, however, the settlers began to make for themselves such articles as shoes, cloth, and lumber. Thus manufacturing began early in this region, and the industry was greatly aided by the water power, caused by the glacier. It was also aided by the many lakes. These serve as reservoirs from which, even during times of drought, a steady supply of water is secured for the falls and rapids.

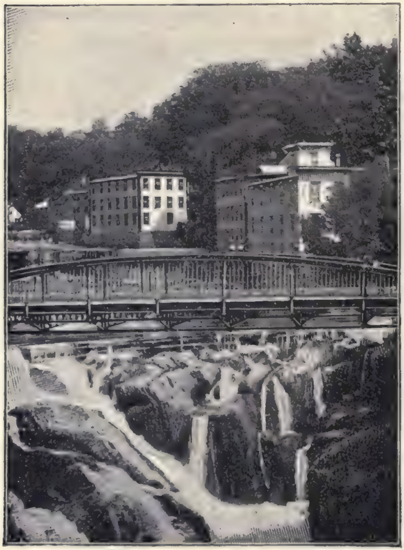


Fig. 113.

A waterfall that supplies power to some factories in one of the smaller manufacturing towns of New England.

Many mills and factories sprang up near the coast, and later in the interior, and thus New England soon became the principal manufacturing section of the whole country. Its many large cities owe their existence chiefly to this industry. Hundreds of articles are made, those composed of cotton, wool, leather, and metal being the most important.

It may seem strange that this should be the case, since none of these raw materials are extensively produced in New England. But the abundant waterfalls furnished such

excellent power that it paid to bring the raw materials there to be manufactured. Therefore, chiefly on account of its water power, manufacturing developed in New England; and the people learned the art so well that factories were later built, even where there was no water power. This is true in BOSTON, for instance, where steam power is used. Nowadays the location of a mill near an important railway, or near some other good shipping point, is a more important matter than its location near water power.

FIG. 114.

A group of factories clustered on the bank of a stream which supplies water power. (Bellows Falls, Vt.)

Cotton Manufacturing. — There are about four hundred cotton mills in New England, making such articles as sheets, towels, stockings, underwear, thread, string, handkerchiefs, and gingham and calico dress goods. As many as twelve hundred persons are frequently employed in a single mill, perhaps three-quarters of whom are women, and they may consume from sixty thousand to seventy thousand pounds of cotton per day. Most of the cotton is brought from Texas and other Southern States; but some of it comes from Egypt and other foreign countries.

The cotton arrives in bales, weighing about five hundred pounds each, and is made into cloth by machinery in the following manner: First the dirt, small sticks, etc., are removed. Then the cotton fibres of various lengths are combed out straight and well mixed with one another. After that they are pressed into thin, gauzelike sheets. These are gradually drawn and twisted into threads, and then wound upon spindles and taken to the *looms* for weaving.

Cotton cloths are nothing more than such threads woven together, those that extend lengthwise of the piece being called the *warp*, and those across it, the *woof*. An ordinary piece of calico has a warp of perhaps twelve hundred threads, while a wide piece of cloth, such as a sheet for a bed, may contain as many as twenty-five hundred. Stripes are made by coloring the threads differently, and then, before the weaving begins, by carefully arranging them according to some design.

Wool Manufacturing. — Wool is cut, or *sheared*, from sheep, and much of that which is manufactured into cloth in New England is obtained from Ohio and other states farther west. Large quantities are also imported from Australia.

After being sheared from the sheep, the wool is washed and freed from burs, sticks, etc. Then it is untangled and combed out straight, after which it is twisted into yarn, much as cotton is twisted into thread. The yarn is woven into cloth for men's suits and overcoats, and also for cloaks, skirts, underwear, blankets, stockings, carpets, and dozens of other articles. Most, if not all, of the garments which you are wearing are either made of wool or cotton, or of the two mixed together.

The cities extensively engaged in the manufacture of either cotton or woollen cloth, or both, are, in Maine, BIDDEFORD, LEWISTON, AUBURN, and AUGUSTA, the capital; in New Hampshire, MANCHESTER, NASHUA, and

DOVER; in Massachusetts, LOWELL and LAWRENCE on the Merrimac River, PITTSFIELD in western Massachusetts, and FALL RIVER, NEW BEDFORD, and TAUNTON in the southern part; in Rhode Island, PAWTUCKET, WOONSOCKET, and PROVIDENCE (Fig. 117), which is the second city in size in New England. One of the largest cotton factories in the world is at Manchester, N.H.

Leather Manufacturing. — Boot and shoe making is carried on in a number of cities, though the most important are LYNN, HAVERHILL, and BROCKTON in Massachusetts. *Leather* is made from the hides of animals, such as cattle, sheep, goats, horses, and hogs. After the hair is removed, the hides are taken to *tanneries*, where they are soaked in a liquid to make them durable.

Some of the tanneries are situated near forests, as in Michigan, where there are many hemlock trees, whose bark produces the tannic acid for tanning. Others are in the mountains of North Carolina, where a kind of oak grows from which tannic acid is made. Some of the tanneries of New England are also near the forest; but many, as those at SALEM, near Lynn, are so far away that the bark, as well as the hides, must be brought a long distance to them.

In other tanneries, chemicals are used in place of the tannic acid from hemlock or oak bark. In a single tannery near Boston, where sheep skins are tanned, from thirty thousand to forty thousand skins are used each week.

After being thus prepared, the leather is brought to the factories and cut up (Fig. 115), one machine cutting out soles of a certain size, a second tops, a third tongues, etc.; these parts are then sewed or nailed together and the shoes are soon finished. As in the case of cotton and wool manufacturing, nearly all the work is done by machinery, each person caring for one or more machines and performing the same simple task day after day.

Fig. 115.

Some small pictures of a shoe factory, showing the men and women at work making shoes. Tell what you see in each.

Besides boots and shoes, leather is made into many other articles, as book bindings, harnesses, pocket-books, and bicycle saddles. Can you not name some others?

Metal Manufacturing. — On account of the water power, New England early became engaged in manufacturing

metals into various articles; and, although steam now largely takes the place of water, these industries are still very extensive, especially in the three southern states. Since almost no coal and iron are produced in this section, these two materials must be shipped from other states. Therefore, large, heavy objects that require much metal and coal are not usually made.

The lighter articles, as jewelry, clocks, needles, cutlery, tools, and firearms, that require a high degree of skill, are the chief articles manufactured from metal in New England. For instance, WORCESTER (Fig. 117), near Boston, is noted for its manufacture of wire and iron goods, besides envelopes, boots, and shoes; PROVIDENCE manufactures great quantities of jewelry; NEW HAVEN, is noted for hardware and firearms; BRIDGEPORT manufactures carriages, sewing machines, etc.; HARTFORD, at the head of steamboat navigation on the Connecticut River, and SPRINGFIELD, farther north in Massachusetts, both produce firearms, cars, and bicycles. FITCHBURG is also engaged in metal manufacturing.

Near Boston, at WALTHAM, the American Watch Company has an immense factory where twenty-one hundred watches are made every day (Fig. 116). About twenty-four hundred persons, more than half of whom are women, are employed there, receiving $100,000 a month in wages. Great numbers of clocks and watches are made in WATERBURY, and jewelry and cutlery at MERIDEN, Connecticut; and in hundreds of smaller cities, towns, and villages in New England there are factories and mills of various sorts. Also some of the cities occupied in cotton and woollen manufacturing, such as FALL RIVER, LOWELL, and NEW BEDFORD, are engaged in the manufacture of iron and other metals. In travelling through the southern portion of New England, one sees busy factories at every hand.

FIG. 116.

The Waltham watch factory. The two middle pictures (C and D) show the crowds of workers leaving the factory at noon.

LARGEST CITIES AND CHIEF SHIPPING ROUTES

The Large Cities. — All this manufacturing calls for an immense amount of cotton, wool, leather, metals, coal, and food; and most of these products come from outside New England. It is not strange, therefore, that there are many cities on the coast. For instance, PORTLAND (Fig. 117), the largest city in Maine, has an excellent harbor, and is the eastern terminus of the Grand Trunk Railway,

which runs through Canada, so that in winter, when the St. Lawrence River is frozen over, it is a shipping point for Canadian goods. NEW HAVEN, the largest city in Connecticut, PROVIDENCE (Fig. 117), the largest in Rhode Island, and BOSTON, the greatest in New England, are all on the seacoast.

The seacoast of New Hampshire is very small, and the largest city, MANCHESTER, engaged in manufacturing, is inland near some falls in the Merrimac River; but on the coast is the important city of PORTSMOUTH. Vermont has *no* seacoast. Its largest city, BURLINGTON, engaged in lumbering and quarrying, is on Lake Champlain, and has much trade with Canada.

Boston and Vicinity. — The most important of all the New England cities is BOSTON, which is fifth in size in the United States. It is itself a great manufacturing centre, being engaged in most of the industries already named, and in making clothing particularly. About it, and but a few miles away, are many large cities and towns in which also are large manufactories (Fig. 117). In addition, these towns serve as places of residence for many of the business men of Boston.

Among these the largest are CAMBRIDGE and SOMERVILLE, (Fig. 117), which are extensively engaged in meat packing, machine manufacturing, printing, and the making of musical instruments, soap, and many other articles.

Other cities near Boston are represented on Figure 117. Among these are CHELSEA and MALDEN, each of which is engaged in manufacturing rubber goods and other articles. Not far from Boston is SALEM, which in the early days was even more important than Boston. Since its harbor is too shallow for the deep ships of the present time, this city has lost much of its commerce, which is now carried on in Boston. Notice in Figure 86 that Salem was one of the large cities in 1790.

Fig. 117.

Boston and vicinity. Also small maps of Providence, Portland, and Worcester. Notice the steamship and railway lines converging at Boston. Also the number of cities near Boston. The reservoirs near Worcester are used to store water for power.

The great size of Boston is due largely to its excellent harbor (Fig. 117) and its central location. Many railway lines reach out from the city toward all parts of the country, while numerous steamship lines connect Boston with all important points along the coast, and with foreign countries (Fig. 117).

The port of Boston is second in importance in the United States. Raw materials are sent there in great quantities for distribution among factories, and the finished goods are shipped all over the world. Also much grain and meat for food reach Boston from the West, and from there are distributed among the smaller cities, or shipped to foreign countries. These, in return, send such articles as coffee, tea, and bananas, which are needed in New England.

Boston and vicinity have been important from the beginning of our history. There, at the commencement of the Revolutionary War, occurred the Boston Tea Party, Paul Revere's Ride, and the Battle of Bunker Hill. The vicinity of Boston is also noted for its literary associations. Harvard College, the oldest in the United States, was founded in 1636 at CAMBRIDGE, three miles from Boston. Yale College, at NEW HAVEN, was established sixty-five years later, in 1701. Longfellow, Lowell, Holmes, and Agassiz were professors at Harvard; and Hawthorne, Emerson, Thoreau, and Whittier lived near by. What writings of these men have you read?

SUMMER RESORTS

New England is so extensively engaged in manufacturing and other forms of business, that immense numbers of people dwell in cities, where, during most of the year, they are closely confined in noisy factories, or in offices and stores. To these, the wooded mountains, the silvery lakes (Fig. 100) and rivers, the

FIG. 118.
Katahdin Lake, Maine. Mt. Katahdin rises in the background.

green valleys, and the rocky seacoast offer such attractions that each summer tens of thousands run away from town for a week, or even for months, to enjoy their vacations at these places.

They go to the green slopes of the beautiful Berkshire Hills and Green Mountains, or climb about among the rugged peaks of the White Mountains to enjoy the magnificent scenery (Fig. 103). Many plunge into the woods of Maine or northern New Hampshire, to hunt and fish, or to canoe upon the streams and lakes, especially the beautiful Moosehead and Rangely lakes.

FIG. 119.
A moose in the woods of Maine.

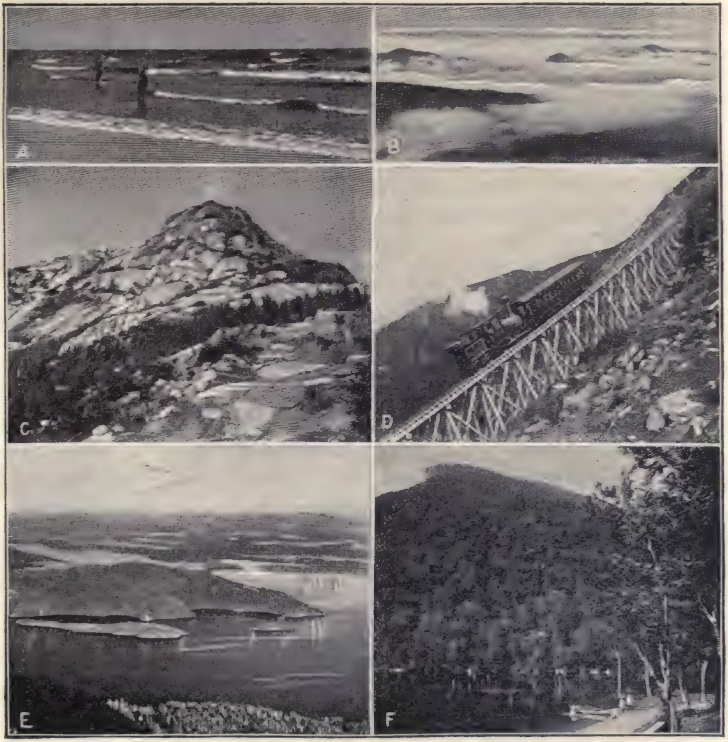


FIG. 120.

Some views among the New England summer resorts. The railway (D) is on the side of Mt. Washington, and the mountain peak (C) is the top of Mt. Monadnock. B shows a view from the White Mountains, looking down on the sea of clouds that fill the valleys. What do you see in the other pictures?

Others settle down at farmhouses to enjoy the quiet of the country (Figs. 102, 111, and 112).

While great numbers visit the woods, mountains, and country, many go to the seashore to escape the heat and to bathe in the salt water, or to sail and row. So many go there, in fact, that almost the entire New England coast is dotted with summer

cottages and hotels. Thousands visit Bar Harbor on Mt. Desert Island in Maine (Fig. 110), which is therefore a very busy place in summer. Nantucket Island and Martha's Vineyard are similar resorts farther south, while Newport, just west of them, on Narragansett Bay, is noted for its many magnificent summer homes. The smaller seacoast towns and cities also have many summer visitors, and the business of caring for them is the chief occupation of many of the people.

QUESTIONS AND SUGGESTIONS

Review Questions. — (1) What effects have the glacier and the sinking of the coast had upon New England? (2) Describe the surface of the country and name the principal mountain ranges. (3) How do ocean currents influence its climate? (4) Describe lumbering in Maine. (5) To what use is lumber put? (6) What cities are noted for it? (7) How are maple sugar and syrup made in Vermont? (8) State how granite is quarried and what its uses are. (9) State the same about marble and slate. (10) Describe each of the kinds of fishing on the New England coast. (11) Tell about the farming. (12) What led to the early development of manufacturing in New England? (13) What now determines the site of a factory? (14) Describe cotton manufacturing. (15) Wool manufacturing. (16) On the map, locate the cities most extensively engaged in either or both of these. (17) Tell about the tanning of leather. (18) About the manufacture of boots and shoes. (19) Locate the cities most noted for these industries. (20) What can you say about the manufacture of metals? (21) Name and locate the chief cities engaged in it. (22) Give several facts about Boston. (23) What large cities are near it? (24) Where and how do the people take their summer outing? (25) Make a drawing of the New England States, including the chief rivers, cities, and the state boundaries.

Review by States: *Maine* (*Me.*). — (1) Draw the coast line of Maine. (2) What makes it so irregular? (3) What are the principal rivers? (4) What cities are situated on each? (5) Much ice is obtained in Maine. Why more than in Connecticut? (6) Should you expect much fishing along the coast? Why? (7) What reasons can you give why so many people resort to the Maine coast and woods in summer? (8) Describe the lumbering in Maine. (9) What cities are engaged in producing lumber? Why? (10) What stones are

quarried in the state? (11) Which is the largest city? How does it compare in size with Boston and Providence? (See table, p. 448.) (12) What other cities in Maine are mentioned in the text? Find them on the map. (13) Draw an outline map of Maine, locating the principal rivers and lakes, the capital, and the chief cities. Do the same for each of the other states as you study about it.

New Hampshire (*N.H.*) — (14) What large lakes are found in this state? What river? (15) Name the cities on it. (16) For what are they important? (17) Why are there not more cities in northern New Hampshire? (18) What industry should you expect there? (19) Find Mt. Washington; it is the highest peak in New England. (20) Where should you expect to find most farming? (21) How does the largest city in the state compare in size with Portland? (See table, p. 448.)

Vermont (*Vt.*). — (22) What large lake on the western boundary? Into what waters does it flow? (23) What river on the eastern boundary? Through what states does it pass? (24) What is the name of the mountains? (25) Lumbering is carried on, as in Maine; into what waters must the lumber be floated? (26) What other Vermont industries are mentioned in the text? (27) There is also farming in the fertile valleys and some manufacturing, as at Brattleboro. Find it. (28) Compare the size of the largest city with that of Manchester, N.H. (see table, p. 448).

Massachusetts (*Mass.*). — (29) Measure the length and width of Massachusetts and compare it with Vermont, New Hampshire, and Maine. (30) Name the large cities near Boston (see Fig. 117). (31) Find Plymouth; for what is it noted? (32) Find the principal cities mentioned in the text and tell where each is located. (33) For what is each important? (34) What advantages do you see in the location of each? (35) Examine the relief map (Fig. 101, p. 125) to see whether Massachusetts is more or less mountainous than Maine, New Hampshire, and Vermont. (36) Where is the mountainous portion of the state? (37) What effect should you expect the mountains to have upon agriculture? (38) Should you expect to find forests there? (39) Remembering what was said about the value of a near market (p. 140), in what part of the state should you expect farming to be most profitable? (40) State as clearly as you can the reasons why Boston has grown as it has. (41) Of what importance is Boston to the cities near by? (42) Of what importance are they to Boston?

Rhode Island (*R.I.*). — (43) Measure this and compare its length and width with that of Massachusetts and Maine. It is the smallest state in the Union. (44) What is the name of the bay in this state?

What cities are situated on it? (45) One way to go from Boston to New York is by rail to Fall River then by Sound steamer (Fig. 117). Why is this preferable to a trip all the way by water? (46) What large city in Rhode Island? (47) Compare its size with Boston and Portland (see table, p. 448). (48) Should you expect much lumbering in Rhode Island? Why? (49) Farming? Why?

Connecticut (*Conn.*, or *Ct.*).—(50) Where are the mountains in this state? (51) Locate each of the cities mentioned in the text. (52) Tell for what each is important. (53) The farms of Connecticut are better than those of Maine. Give reasons for this. (54) There is almost no lumbering in the state. Why? (55) Compare the size of New Haven with that of Boston and Portland (see table, p. 448).

General.—(56) Name the industries of New England. Tell in which states they are carried on. Which industry do you consider to be the most important? (57) Make a list of the ten largest cities (see table, p. 448) in New England, the states they are in, and the business they are engaged in.

SUGGESTIONS.—(1) Read Whittier's Snowbound. (2) Read about lumbering in Chase and Clow's Stories of Industry, Vol. I. (3) Dissolve some maple sugar in water to make syrup; then boil it to evaporate the water, making sugar again. (4) Visit a stone-yard, or a place where monuments are made, and collect some specimens from the chips in the yard. (5) Find blocks of granite and marble in buildings. (6) Find out how fishing was carried on in the olden times by reading Chapter xxi. in the book of John, New Testament. (7) Make drawings of mackerel, cod, and halibut. You will find pictures of them in the dictionary. (8) Make a collection of cotton, wool, leather, and metals for the school. Also make a collection of articles manufactured from them. (9) If cotton is worth 7½ cents per pound, how much would the 70,000 pounds, that one mill uses in a day, be worth? (10) The cotton mill referred to on page 143 consumes 25 tons of coal per day, besides depending partly upon water power: if the coal costs $3.00 per ton, what is the coal bill for a year? (11) What are the average wages per hour of the hands in the Waltham Watch Factory; the working day there is ten hours long. How many watches are made per minute? Per year? (See the figures on p. 147.) (12) Visit some factory to see how its work is carried on. (13) Find out about the ice industry in Maine.

For REFERENCES TO BOOKS AND ARTICLES, see page 439.


MIDDLE ATLANTIC STATES
Scale of Miles
0 50 100 150
Capitals of Countries: Capitals of States: Other Cities:
Cities with over 1,000,000: New York
Cities with 500,000 to 1,000,000: Baltimore
Cities with 200,000 to 500,000: Buffalo
Cities with 50,000 to 200,000: Allegheny
Cities with 25,000 to 50,000: Roanoke
Smaller Places: Grafton
Capitals with less than 25,000: Dover
DOMINION OF CANADA
QUEBEC
ONTARIO
LAKE HURON
Georgian Bay
LAKE ONTARIO
LAKE ERIE
MICH.
NEW YORK
VERMONT
MASS.
CONN.
Ottawa
Montreal
Kingston
Toronto
Hamilton
London
Detroit
L. St. Clair
Ottawa R.
St. Lawrence R.
Richelieu R.
Niagara R.
Welland Canal
Erie Canal
Ogdensburg
Plattsburg
Lake Champlain
Adirondack Mountains
Green Mts.
Montpelier
Ticonderoga
Lake George
Watertown
Black R.
Oswego
Oneida L.
Rome
Utica
Mohawk R.
Gloversville
Saratoga Springs
Glens Falls
Amsterdam
Little Falls
Schenectady
Watervliet
Cohoes
Troy
Albany
Syracuse
Auburn
Cayuga Lake
Cortland
Ithaca
Seneca L.
Geneva
Rochester
Lockport
Niagara Falls
N. Tonawanda
Buffalo
Genesee R.
Dunkirk
Chautauqua L.
Jamestown
Olean
Hornellsville
Elmira
Binghamton
Catskill Mountains
Catskill
Hudson
Kingston
Poughkeepsie
Newburgh
Hudson R.
Connecticut R.
Hartford
Erie
Meadville
Bradford
Blossburg
82° 80° 78° 76° 74°
46° 44° 42°


CONN.
New Haven
Hartford
Poughkeepsie
Newburgh
Middletown
Peekskill
Yonkers
Long Island Sound
LONG ISLAND
New York
New York Bay
Long Branch
Hoboken
Paterson
Jersey City
Orange
Newark
Elizabeth
NEW JERSEY
Trenton
Camden
Bridgeton
Millville
Atlantic City
Cape May
Cape Henlopen
Delaware Bay
Dover
DEL.
Wilmington
Chester
Philadelphia
Norristown
Reading
Allentown
Easton
Delaware R.
Scranton
Wilkes Barre
Shamokin
Pottsville
Lebanon
Lancaster
York
Harrisburg
Susquehanna R.
Williamsport
Blossburg
W. Br. of Susquehanna
PENNSYLVANIA
Dubois
Oil City
Meadville
Allegheny R.
Newcastle
Beaver Falls
Allegheny
Pittsburg
McKeesport
Johnstown
Altoona
Washington
Connellsville
Chambersburg
Hagerstown
Frederick
Baltimore
Annapolis
Cambridge
MARYLAND
Cumberland
Martinsburg
Winchester
Potomac R.
DISTRICT OF COLUMBIA
Washington
Alexandria
Luray Cave
Fredericksburg
Charlottesville
Staunton
Blue Ridge
Allegheny
Appalachian
VIRGINIA
Natural Bridge
James R.
Richmond
Manchester
Petersburg
Lynchburg
Roanoke
Newport News
Old Point Comfort
Cape Charles
Cape Henry
Chesapeake Bay
Portsmouth
Norfolk
Dismal Swamp
Danville
Dan R.
Staunton R.
Roanoke R.
Albemarle Sound
Plymouth
NORTH CAROLINA
Greensboro
Durham
Raleigh
TENN.
Abingdon
Bristol
Cumberland Mts.
Pine Mtn.
Pocahontas
Hinton
White Sulphur Springs
New R.
WEST VIRGINIA
Charleston
Huntington
Big Sandy R.
Gt. Kanawha R.
Parkersburg
Clarksburg
Grafton
Buckhannon
Monongahela
Ohio R.
Muskingum R.
OHIO
Wheeling
Steubenville
Zanesville
Cleveland
Sandusky
Youngstown
Akron
Canton
Mansfield
ATLANTIC OCEAN
40°
38°
36°
82°
80°
76°
74°
Longitude West 78° from Greenwich
THE M. N. CO.

FIG. 121.

IX. MIDDLE ATLANTIC STATES

Map Questions. — (1) Which states have mountains? (2) Which has none? (3) What influence do you think the mountains have upon the industries? (4) What waters help to form the boundary of this group of states? (5) Find where natural boundaries separate the states. (6) What would have formed a more natural boundary for the northernmost part of New York? (7) For the boundary between Massachusetts and New York? (8) Measure the length and width of this group of states and compare them with the New England States. Notice that the scale of the two maps is different. (9) Which is the largest state? Is it larger or smaller than Maine? (See table, p. 445.) Which is the smallest state? Is it larger or smaller than Rhode Island? (10) Name the three bays. Why has a city at the head of one of these bays a better location than one at the entrance? (11) Name the capital of each state. (12) Why has Harrisburg a better location for the capital of Pennsylvania than Philadelphia? (13) The capital of the United States is in the eastern part of the country. Why? Where would a better location be? (14) Each of the bays has a river entering it. How does that happen? (See pp. 19 and 20.) (15) Name the five largest rivers. Into what waters do they flow? Through what states?

Physiography. — The Appalachian mountain ranges and plateaus, with their stores of coal and iron, extend across these states from northeast to southwest. Just east of the mountains is a low, hilly plateau of hard rock, called the *Piedmont*[1] *plateau.* This low, hilly region is really a worn-down mountain land like New England; in fact, it represents the very roots of those mountains which rose above the sea long before the Coal Period (p. 2). The land slopes seaward, and the streams flow in short courses in the same direction.

[1] Piedmont means foot of mountain.

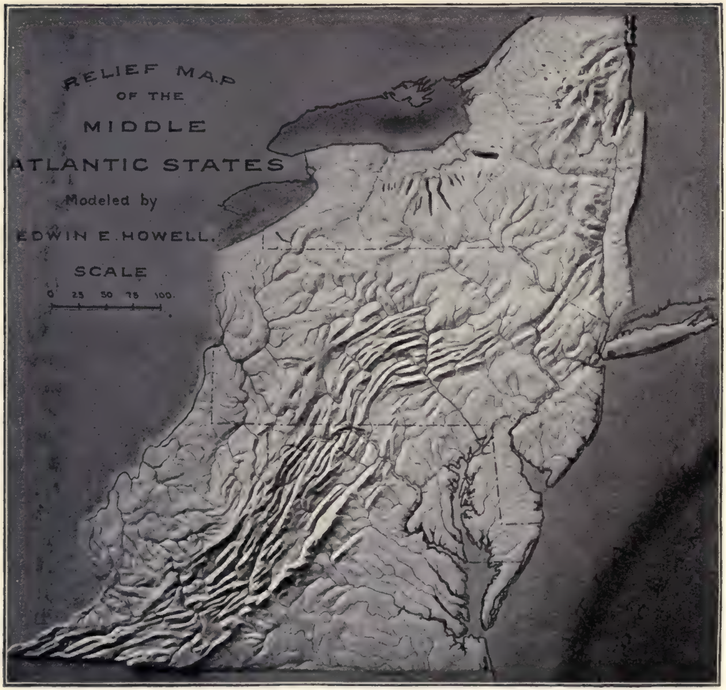


FIG. 122.

Where are the lakes found? Why in that part?

Nearer the seacoast the country is a low plain of softer rocks, chiefly sands and clays, that were deposited on the sea bottom and then raised to form dry land. These plains, added to the country not many ages ago, are known as the *coastal plains* (Fig. 96).

From New York to Alabama the line of division between the Piedmont plateau and the coastal plains is marked by rapids and low falls near where streams cross it, and it is, therefore, called the *fall line* (Fig. 123). There are rapids and

falls at this place because the streams dig more rapidly into the soft layers of the coastal plains than into the harder rocks of the Piedmont plateau.

Since the rapids and falls determine the place where boats passing up stream must stop, and also where there is water power, the earlier settlers located their villages on the fall line, as the Indians had done before them. Note (Fig. 123) how many large cities are on this line. Name them.

FIG. 123.

The fall line. Coastal plains dotted, Piedmont and other sections left white. Cities printed in heavy type are located along the fall line.

Although at first the Appalachians acted as a serious barrier to westward migration (p. 102), at the beginning of this century many emigrants pushed their way across the mountains. This migration was greatly aided by the fact that numerous rivers, such as the Mohawk, Delaware (Fig. 124), Susquehanna, Potomac, and James, flow across a part or the whole of the mountain system. They offered a comparatively easy route across the mountains and therefore formed gateways to the fertile western plains beyond. Trace each of these rivers from its source to its mouth.

FIG. 124.

The Delaware Water Gap, where the Delaware crosses a mountain ridge.

On the west side of the Appalachians there is a plateau, sloping gently toward the Ohio and

Mississippi rivers, called the Appalachian plateau. Near the mountains, in West Virginia and Pennsylvania, the plateau is so deeply cut by rivers, and therefore so rocky that it would probably have attracted but few settlers had it not been for the rich coal beds enclosed in its strata. The mining of this coal has been greatly aided by the work of the rivers, which have in many cases cut down to the coal beds and brought the coal to light (Fig. 8).

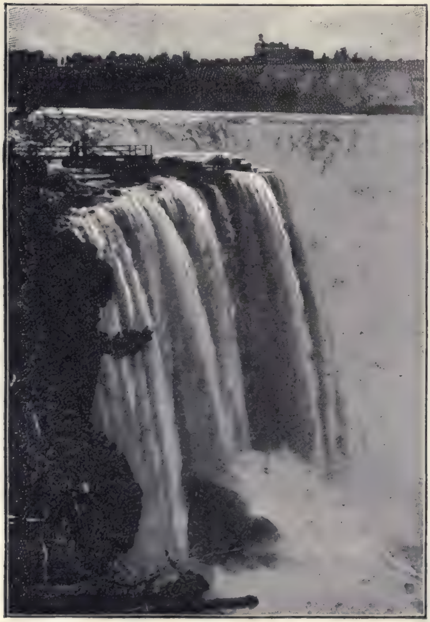


FIG. 125.
A view of Niagara Falls.

Owing to the fact that the glacier did not spread over the southern part of this group of states (Fig. 13), few lakes and waterfalls are found there. But they abound in New York and northern New Jersey and Pennsylvania, which the glacier covered. Indeed, on the boundary of New York is the greatest waterfall in the world — the famous Niagara (Fig. 125). Two of the Great Lakes are also partly in New York, and a number of other large lakes are within its boundaries. Name some of them. See map, Figure 121, opposite page 157.

In the Middle States, as in New England, the sinking of the land has produced numerous large bays and fine harbors, through which the tide often reaches far inland. In the Hudson River, for example, the tide extends above Albany, and in the several branches of the Chesapeake Bay it reaches nearly to the fall line.

Most of the coast is low and sandy, with a gradual descent into the sea, so that bathing is excellent (Fig. 126). Because of this fact and the cool sea breezes of summer, the coast is noted for its numerous summer resorts, especially near the large cities.

FIG. 126.
A New Jersey beach in summer.

Climate. — The northern part of New York reaches to the 45th parallel of latitude. How far is that from the equator? From the north pole? How much nearer the equator is the southern part of Virginia?

While the climate of the northern portion of this group of states resembles that of New England, the climate of the southern portion is much warmer. Its greater warmth is due partly to the lower latitude, and partly to the ocean currents. The cold Labrador current does not extend south of Cape Cod; but the Gulf Stream passes very near the Virginia coast (Fig. 59).

The climate is so mild in Virginia that sleighing and skating are rarely possible, while places near the entrance of Chesapeake Bay — as Old Point Comfort and Newport News — are important winter resorts. Among the mountains, however, the climate is cooler; and even as far south as Virginia and North Carolina there are cool summer resorts on the mountain sides.

The variable winds, caused by the cyclonic storms, supply all of these states with thirty or forty inches of rain per year (Fig. 46), which is sufficient for crops and for dense forests. Because of its climate and products, the

Fig. 127.

A view in the forest-covered Adirondacks of New York. (Copyrighted 1889, by S. R. Stoddard, Glens Falls.)

region is well fitted to support a dense population; and next we shall see where the largest numbers of people are collected, and in what occupations they are engaged.

Forests. — Many of the prominent industries in these states are the same as those of New England. For example, there are extensive forests both in the Adirondack and Appalachian mountains, and upon the Appalachian plateau near their western base. In the southern part, as in West Virginia, many hardwood trees are found; but in the northern portion both the trees and the methods of lumbering resemble those in Maine.

WILLIAMSPORT, in Pennsylvania, is extensively engaged in the lumber business, as Bangor is in Maine. There are also many paper-mills supplied from the forests, as in WATERTOWN near the Adirondacks.

Over most parts of this section the woods have been so wantonly destroyed that it is now necessary to protect those that are left. New York State has established large forest reservations, and founded a College of Forestry at Cornell University, in ITHACA. Besides this, some large tracts of woodland, called *game preserves*, are carefully protected by certain citizens for the purpose of fishing and hunting at the proper season.

Fish and Oysters. — Fishing is a much less important industry than in New England. In the bays many *shad* are caught. This fish swims up the bays and rivers each spring in order to lay its eggs in fresh water, where the young remain until they are large enough to venture to the sea.

Oysters are found from Cape Cod to the Rio Grande (Fig. 348, p. 417); but one of the best localities for them is Chesapeake Bay, where the waters are warm and quiet. From this region they are collected in great quantities. Some are shipped away fresh in the shell, but many are canned, like fruit. BALTIMORE and NORFOLK are especially noted for this industry.

When young, the oysters swim about freely; but after reaching a certain age, they sink to the bottom, fasten themselves to some solid substance, like a stone or an oyster shell, and never move from that spot. They depend for food upon what is brought to their mouths by the incoming and outflowing tides. Oysters prefer comparatively shallow water and can sometimes be picked up by hand from a boat; but usually they must be dragged or *dredged* up by a long-handled rake. Small steamers and sailing boats are used for gathering them. So profitable is the industry that in many places there are private oyster beds, or "plantations," which are carefully protected.

Agriculture

There is more good farm land in these states than in New England, and therefore agriculture is a more important industry. The low, level, coastal plains, the gently undulating Piedmont plateau, and nearly all of New York State, excepting the Catskill and Adirondack mountains, are dotted with farms. Also in the valleys of the Allegheny plateau, and in the broad valleys between the Appalachian ridges, there is much farming land. In fact, there were farms in the latter valleys even before there were settlers in the prairie states farther west. The numerous large cities call for quantities of vegetables and small fruit, and consequently there is much truck farming.

Dairying. — Many farmers turn their attention chiefly to dairying; and, although butter and cheese are made in every state in the Union, this work is so important in New York that it is described at this point.

Fig. 128.

A dairy herd in New York, on the way to the barn in the evening.

The number of cows in a dairy herd (Fig. 128) varies from a dozen to several score. In summer they are usually allowed to graze in pastures, but during the winter they are fed in large barns. Twice each day they are milked, and the milk may be sent to a neighboring city to be sold by the quart, as

in New England (p. 141), or it may be kept for butter. In the latter case it is placed in a rapidly revolving machine, called a *separator*, which separates the cream from the milk. The cream is then churned until butter is made. The skimmed milk, left after the cream is separated, and the buttermilk, left after the butter is made, are generally of little use.

The best cheese is made from fresh milk; but the process is too difficult to be described here. UTICA, on the Mohawk River, is an important cheese market; and scattered all over New York are small cheese and butter factories, or *creameries*. These are of great value to the surrounding farmers, since they furnish a ready market for the milk, some of which is brought to the creameries on trains.

FIG. 129.
The tobacco plant.

Tobacco. — Among the plants which the early explorers found in America was the tobacco. Much to the astonishment of the Europeans, the savages smoked the dried tobacco leaves in pipes. However, the newcomers quickly learned to smoke also, and tobacco soon became one of the leading products shipped to Europe. Now its use extends throughout the world. So much tobacco is now consumed that, although produced in many countries, tens of thousands of men in the United States alone are employed in raising and preparing it for the market.

The climate of most parts of New England and New York is too severe for this plant; but large quantities are raised in the Connecticut Valley lowland, and in the valleys of southern New York, Pennsylvania, and Ohio (Fig. 333, p. 410). However, the state most noted for its production is Virginia. In the vicinity of LYNCHBURG and DANVILLE, where much tobacco manufacturing is carried on, immense quantities are raised; and RICHMOND, not far away, is one of the greatest tobacco markets in the world. Find these cities.

The plant, which grows to a height of about three and a half feet, has thick, hairy leaves which are large and broad (Fig. 129), somewhat like those of the pie-plant or rhubarb. The leaves, which are the valuable part of the plant, are plucked in the fall, hung in a room to dry, and then made into some form for use. Cigars are manufactured by carefully wrapping the leaves together by hand, while in plug tobacco they are mixed with licorice, molasses, and some other substances, and pressed closely together in machines. When the leaves are cut into fine bits, the product is used for snuff, cigarettes, and pipe tobacco.

Tobacco contains a poison called *nicotine*, which, in small quantities, is used as medicine, but in large quantities is extremely injurious. Even the amount that enters the system from smoking is sufficiently poisonous to injure most people. It seriously affects the nerves, and excessive smokers have suffered intensely from it. Persons who have not reached maturity are especially injured by it.

Fruits and Vegetables. — Both the fertile soil and the climate of these states are well suited to fruit raising. Nearly every farmer raises some fruit. But the sections near water have the best climate for it, because the water causes the air to be cooler in summer and warmer in winter.

For example, the Chautauqua grape belt, in western New York, is along the southern shores of Lake Erie. There one may drive for scores of miles in the midst of vineyards (Fig. 130), where the air in springtime is laden with the fragrance of the grape blossoms, and in the fall with the tempting odor of the ripe fruit (Fig. 131).

Apples form another important fruit crop in New York, being grown in many parts of the state, but especially along the southern shores of Lake Ontario. So much

Fig. 130.
A vineyard in New York.

fruit is cultivated in New York that the nursery business, or that of raising young fruit trees and bushes to sell, is greatly developed. One of the principal centres for this business is Rochester.

On the coastal plain and Piedmont plateau of eastern New Jersey, Delaware, Maryland, and Virginia, grapes, berries, especially strawberries, apples, and other fruits flourish. Aside from fruit, such common vegetables as potatoes, tomatoes, beans, and sweet corn, are raised in all parts of these states.

All of these fruits and vegetables are eaten fresh during the proper season, being used in such quantities that they are sent to the cities on fast trains, and even in special cars. They are prepared for the table in other ways also; for instance, the juice of grapes is made into wine, and that of apples into vinegar. Two sections of the United States produce quantities of *wine*, one being New York, the other California. But much less is made in this country than in France, Germany, and other parts of Europe.

FIG. 131.
Clusters of grapes in a vineyard in central New York.

Wine is made by pressing the juice out of the grape and allowing it to ferment. *Cider* is made by squeezing the juice out of apples in strong presses. When fresh, this juice is *cider;* but after it has stood for some time, it turns to vinegar.

The *canning* of fruits and vegetables for winter use has become an important industry in several cities, as in BALTIMORE and WILMINGTON. Many farmers are engaged almost entirely in raising fruits and vegetables for this purpose. Probably as many peaches, berries, tomatoes, etc., are put up in cans as are eaten in the fresh state. The tin cans in which they are preserved are to be seen in every grocery store.

Many other crops, such as hay and grain, are raised in the Middle Atlantic States; but a description of these will be given in connection with the states further west, where such crops are produced on a much larger scale (pp. 243–247).

This farming not only supplies *food* to the residents of the cities, but it also furnishes many of them with *occupa-*

tion. The marketmen and grocerymen, for instance, receive a profit when they sell vegetables, whether fresh or canned. The workmen in the flour-mills and canneries are also supplied with work by the farmers. Many other factories are established because of farming ; for example, the agricultural implement factory at AUBURN, New York (p. 179). Even much of the lumbering and mining is done because the farmers need furniture, ploughs, etc. Besides this, supplying goods needed by the farmers forms an important part of the business in many cities, like LANCASTER, Pennsylvania, which is in the midst of a rich farming country.

MINING

The products from underground are far more important in these states than in New England.

Salt. — One of these is salt, a mineral which every person must have. In the early days salt springs were discovered at the point where SYRACUSE stands, and that city owed its early growth to those springs. Little salt is now produced there; but immense quantities of soda are made of brine obtained from the beds of salt near by.

These beds of salt were deposited in the ancient sea which covered this region before the Coal Period, and were then buried beneath layers of rock. They lie deep down in the earth in the region south of Syracuse and Rochester, and from them salt is obtained at a number of places. In fact, New York produces more salt than any other state.

When in the earth, salt is hard, somewhat like coal, and must be obtained in one of two ways. In one case a hole is bored to it and water allowed to run down and dissolve it; then the brine is pumped up and the water is evaporated by heat until only the salt is left. In the other case, a deep hole, or *shaft,* large enough for men to pass up and down, is dug down

to the salt; then lumps of salt are broken off and hoisted to the surface. A salt mine is a beautiful sight with its clear, crystal-white walls and clean floor.

Coal. — Although there is little water power south of the region formerly covered by the glacier, there is coal — an excellent substitute. The coal swamps that existed millions of years ago (p. 3), stretched westward from the ancient Appalachian Mountains beyond the Mississippi River. In some places the coal has been entirely washed away. In others, it is sometimes found close to the surface and sometimes several hundred feet beneath it. Most of this is soft or *bituminous* coal, which is mined in enormous quantities in the neighborhood of PITTSBURG and ALLEGHENY.

FIG. 132.
A view in a coal mine in Pennsylvania.

When the plains and plateaus that contain the coal beds were raised above the sea, they were nearly everywhere lifted without much folding. This was the case in western Pennsylvania, Ohio, Indiana, and Illinois; but in central Pennsylvania, mountains were formed, and there the rocks, including the coal beds, were folded. During the

long ages that these mountains have been exposed to the weather, the mountain tops have been greatly lowered. Also rivers have carved out deep valleys, and thus most of the coal in that section has been washed away and carried to the sea. In two or three places, however, as near WILKES BARRE and SCRANTON, beds of hard, or *anthracite*, coal remain. It is to this coal that these cities owe their importance. In that mountain region the coal beds were so deeply folded that neither the weather nor the rivers have been able to remove them; and they remain, therefore, as remnants of much larger beds, preserved because of their protected position.

Anthracite coal was first made in the same way as soft coal. Had it not been subjected to the pressure caused by the mountain folding, it would doubtless have formed a bituminous coal; but the pressure has changed it by driving off the gases that form a part of all woody matter. These changes have made the coal harder and more difficult to burn. However, since it gives forth a more intense heat than bituminous coal, it is preferred for some purposes, such as heating and cooking. Throughout New England and many parts of the Middle Atlantic States, anthracite is the only coal used for these purposes.

Most of the anthracite beds lie far below the surface, and deep *shafts* have to be sunk to reach them. From the sides of such a shaft, *tunnels* are dug into the beds, and from these the coal is removed. Usually there are several beds of coal, with thick layers of rock between them, and the shaft extends downward through them all, with tunnels reaching out from it at each level of the mineral (Fig. 133). In a large mine one may travel for days through miles and miles of dark tunnels.

The workmen break the coal with the aid of steam drills and picks, and they furnish their own light by means of lamps fastened to their caps. After the coal is broken loose, it is placed in small cars, drawn to the shaft by mules, or by

electricity, and then hoisted to the surface by steam. The mules are kept underground for months, being fed and allowed to sleep in stables cut out of solid coal.

In the early days the coal mining was carried on by Americans, and many are still employed at it. Now, however, foreigners are extensively employed in various branches of the work, and in a coal mine one may hear many different languages spoken. There are so many of these workmen needed that

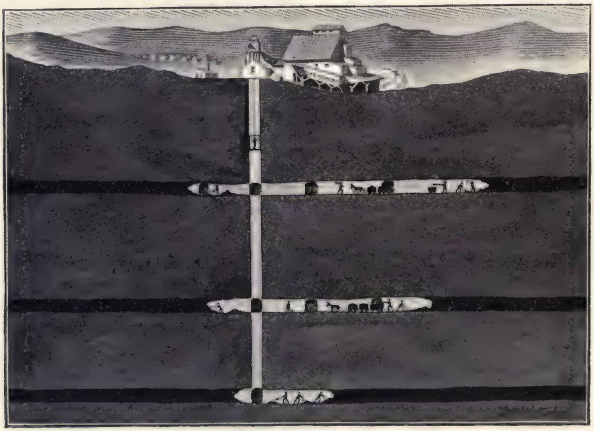


Fig. 133.

Diagram to illustrate how coal is dug out of the beds in tunnels, and raised to the surface through shafts.

they form regular colonies, living near the mines in houses which they rent from the coal companies. Sometimes, when there is little demand for coal, the miners have no employment for weeks; and, becoming dissatisfied with their lot, they now and then refuse to work, or *strike*. These strikes are organized by the labor unions, and the strikers act together for the common interest. Violence is rarely resorted to, although at times there is hard feeling between the employers and the employees.

Oil and Gas. — In the plateau along the northwestern border of the Appalachian Mountains, two fuels, oil and gas, are found. *Petroleum*, as the oil is generally called, means "rock oil," a name which suggests its origin.

Ages ago, when these layers of rock were being deposited on the ocean floor, countless numbers of animals and plants, dying and dropping to the bottom, were imprisoned and deeply buried. These plant and animal fossils then slowly decayed, forming oil and gas. Later, the oil and gas were stored in the earth in the pores between the grains of sandstone and other rocks. Very nearly the same kind of oil is now made from fish, and nearly the same kind of gas rises from plants that are decaying in swampy places.

As soon as an opening is made through the rock by boring into it, the gas, which is associated with petroleum, rushes forth, and is conducted away in pipes, often to distant places. Thousands of homes in BUFFALO, PITTSBURG, and other places are heated with natural gas; and in many factories, too, the gas is used for fuel.

Petroleum also flows out from the borings or *oil wells;* but frequently it must be pumped out. Near the oil wells cities have grown up, such as BRADFORD and OIL CITY in Pennsylvania, and OLEAN in New York. After being taken from the earth, the petroleum is stored in large tanks and then refined (Fig. 134). In its natural state it is a thick, dark yellow or reddish yellow fluid; but in the refinery it is changed so that the greater part of it becomes clear, colorless, *kerosene* oil. Benzine, naphtha, and gasoline are also made from it. The thick substances left after the refining are used in making dyes of various kinds, machine oil, vaseline, and paraffin. One important use for the latter is in the manufacture of chewing gum.

No region in the world furnishes so much oil as western Pennsylvania, West Virginia, and eastern Ohio. The only section of the world that approaches it is in Russia near the Caspian Sea. The oil business, which is one of the great industries of the country, is in the hands of the Standard Oil Company, which has absorbed a large number of the small dealers. From the wells the oil is led to the refineries in pipes many miles long, and the company owns immense numbers of special tank cars for carrying the kerosene over the country, and steamers for shipping it to foreign lands. • Watch for one of the tank cars and describe it.

FIG. 134.
Oil tanks in an oil refinery.

Iron Ore. — Pennsylvania and West Virginia enjoy a great advantage in having within their own borders an abundance, not only of coal, but also of oil and gas for fuel. Iron ore is also found in Pennsylvania, Virginia, and other states. Thus both the raw material and the fuel necessary for manufacturing it into useful articles are found almost side by side. Of course the cities of the neighboring states, such as New York and New Jersey, are also able to obtain these materials.

This is very important, since iron is the most valuable metal for manufacturing that exists. Like coal, this iron ore was prepared long ago, though in a very different manner. Small quantities of iron exist in many minerals and rocks, the red and yellow colors of many soils being due to it. As water slowly seeps through the rocks it dissolves the iron, much as it would

dissolve salt or sugar if those substances were there. In some places, where the conditions have been favorable, the water has brought quantities of the iron to one place and deposited it, forming beds, or *veins*, and it is these that are now being mined.

Sometimes the beds lie very deep, and again they are so near the surface that the iron ore is dug out of great open pits, as stone is taken from quarries. In appearance, iron ore is sometimes a hard, black mineral, sometimes a soft, loose, yellowish or reddish-brown earth. It is not iron at all, any more than wheat is flour; it is only the iron ore mineral out of which iron may be made by a great deal of work.

FIG. 135.
Coke ovens, on the right and left, and piles of coke lying about ready to be drawn away on the railway.

Iron and Iron Goods. — It is easy to see that one of the principal industries of this section must be connected with iron. Two materials, *coke* and *limestone*, are used with the iron ore to reduce it to the metal. The coke is made from bituminous coal, and the limestone is obtained in quarries.

To obtain coke, coal is placed in stone or brick furnaces, called *coke ovens* (Fig. 135), built in such a manner that very little air can reach the coal, which is then set on fire. Many

of the gases that form a part of coal are thus either burned up or driven out. One of these gases is the same as that which is used for street lights and for illuminating houses. So little air is let into the ovens that not all substances in the coal are burnt. The part left is the very light, porous coke which can then be burned and made to furnish intense heat, if supplied with plenty of air.

In reducing iron ore to iron, more coke is used than ore, so that it is an advantage to have the mines of coal and iron ore near each other. The coke, iron ore, and limestone are all placed together in a high, tower-like structure, called a *blast furnace*, (Fig. 136), so named because blasts of air are forced through it to produce a strong draft while the coke is burning.

FIG. 136.

The outside of a blast furnace. The large round tower on the left is the furnace; the tall slender tower, the chimney; the other, an elevator for hoisting the ore, coal, and limestone which are placed in the top of the furnace.

Such great heat melts the ore and limestone; and the iron, being heaviest, sinks to the bottom of the fiery-hot liquid. The limestone, and those elements of the ore that are not iron, rise to the surface, forming *slag* — a worthless substance that is drawn off through an opening in the furnace and thrown away. Through a lower opening in the furnace, the iron is run off into trenches made of sand on a sand floor.

There is one main trench with numerous side branches, and each of these has still smaller branches connected with it, as in Figure 137. When the molten iron cools, the little bars of iron are attached to a larger one, much as baby pigs fasten themselves to the mother sow; because of this resemblance it is called *pig iron.* These rough bars, which may be easily lifted, are then broken off and shipped away to be made into thousands of different articles.

Fig. 137.

Molten iron running out of a blast furnace into trenches, where it cools to form pig iron.

Some iron goods, such as stoves and the iron parts of your desk, are nothing more than this pig iron melted and cast, in moulds, into the shape that is desired. This is *cast iron*, which is so brittle that it easily breaks under a heavy blow. Other materials, such as knife blades, boiler plates, rails for railways, and watch springs, are made of *steel.* This also is made of pig iron, though after it has been greatly hardened and strengthened by an expensive process.

Wrought iron, a third kind, is used where it is necessary for the metal to bend and yet be tough, as in nails and iron wire.

Almost every city in the Middle Atlantic States is engaged in iron work of some kind, some in making iron and steel out of ore, others in manufacturing iron and steel goods. For example, in New York State, BUFFALO manufactures car wheels, machinery, and many other articles. It has nearly four thousand manufactories, many of

them making iron goods; and in NEW YORK CITY almost all kinds of iron goods are made. Iron and steel goods, bicycles, etc., are manufactured in SYRACUSE; stoves are made in ALBANY and TROY; and there are iron founderies in BINGHAMTON, ELMIRA, and SCHENECTADY.

In Pennsylvania, PHILADELPHIA manufactures steel ships, cars, and hundreds of other iron goods; PITTSBURG and ALLEGHENY (Fig. 209, p. 274) make steel and iron goods of nearly every kind; and SCRANTON, READING,

FIG. 138.

Pittsburg, where so much iron manufacturing is carried on.

HARRISBURG, ERIE, ALTOONA, and a score of other places have furnaces, founderies, and machine shops for iron manufacturing. In New Jersey, JERSEY CITY, NEWARK, CAMDEN, and HOBOKEN manufacture iron goods; in Delaware, WILMINGTON is noted for its cars and steel ships; in Maryland, BALTIMORE, like Philadelphia and New York, has a great variety of iron manufactures. WHEELING in West Virginia, and ROANOKE in Virginia, are also engaged in iron manufacturing. Almost any article of iron that you might name is made in these cities.

The importance of even a single manufactory is proved by the following facts: At D. M. Osborne Company's works, AUBURN, New York, where farming implements, such as mowers, rakes, reapers, and harrows, are made, over 2700 men are employed, making one complete implement every 40 seconds. Each year these men and their families consume about 9000 barrels of flour, 62,000 bushels of potatoes, 200,000 dozen eggs, 1,400,000 quarts of milk, 375,000 pounds of butter, and 1,300,000 pounds of meat, besides much coffee, tea, and sugar. Since they also need to buy clothes, shoes, etc., this one factory, by furnishing the money for all these purchases, helps to support farmers, storekeepers, shoe manufactories, railways, and many other industries; but since it is the farmer who buys the implements, it is he who has caused the factory to be needed. One is really dependent upon the other.

Glass, Pottery, Bricks, etc. — Three other mineral products are especially worthy of note. Glass is manufactured at and near PITTSBURG, WHEELING, and many other places, especially where natural gas furnishes cheap fuel. In the vicinity of the former city are sands which, when melted and mixed with other substances, make an excellent quality of glass. Pittsburg is the greatest centre for plate glass in the country.

FIG. 139.
A potter's wheel in the works of the Trenton Potteries Company.

In and near TRENTON, New Jersey, there is a kind of clay which may be man-

ufactured into pottery of a very high grade, and pottery making has become an important industry in that city. To make such earthenware the clay is shaped by skilful workmen into cups, saucers, vases, etc. (Fig. 139), and then baked until it is hard.

So many bricks are used for building, that brick yards are found in the neighborhood of nearly all cities. Bricks are made of clay, which is pressed into the brick shape when damp, then dried, and finally baked. In this process some of the grains melt, so that, when cooled again, they cling together like stone. The clays near PHILADELPHIA, and the great clay beds of the Hudson valley above NEW YORK CITY, supply an abundance of brick for these great cities.

Many other kinds of manufacturing might be mentioned, as that of flour at ROCHESTER, New York ; silk at PATERSON, New Jersey ; shirts, collars, and cuffs at TROY ; starch at OSWEGO ; cotton goods at UTICA ; boots and shoes at BINGHAMTON and ROCHESTER ; carpets at YONKERS ; and plush at JAMESTOWN. There is some manufacturing in nearly every town ; and in the large cities so many different kinds flourish that a score of pages would be required even to enumerate them.

LARGEST CITIES AND CHIEF SHIPPING ROUTES

Location of New York City. — The greatest of all the cities of the United States is New York, which contains about three and a half million inhabitants, and is second only to London among the great cities of the world. There are several other large cities in its immediate vicinity, as JERSEY CITY, NEWARK, ELIZABETH, PATERSON, and HOBOKEN (Fig. 146), all across the Hudson River

in New Jersey, but, so far as their business relations are concerned, forming a part of New York City. Before its union with New York, the great city of Brooklyn, on Long Island, was fourth among the cities of the country.

Such a vast collection of people in one section is due chiefly to the excellent harbor and the ease with which goods may be sent westward by water and by rail, making this the principal shipping point in America. More than half of all the foreign trade of the United States is carried on through this port.

Fig. 140.
Brooklyn Bridge in New York City.

The tide reaches up the Hudson above Albany, and the Erie Canal extends from there westward to Buffalo (Fig. 141), on Lake Erie, a distance of 350 miles. From that point one is able to go by way of the lakes to Cleveland, Detroit, Chicago, and Duluth. Thus, by the aid of this canal, New York City is connected by water with a vast inland territory which is highly productive and thickly populated. By sea New York is connected with different parts of the world, and steamships are constantly entering and leaving its harbor.

FIG. 141.

The Erie Canal and other water routes of New York and vicinity.

Erie Canal. — This canal, which is over 350 miles long, follows the easiest route westward from the Eastern States, the route used by the Indians before the white men came. Since the canal is only seventy feet wide and seven feet deep, all freight coming from the West in lake steamers, and intended for the canal, must be unloaded at BUFFALO, and placed in *canal boats*. These clumsy-looking boats are made with broad, flat bottoms, in order that they may carry heavy loads without sinking

deep into the water. They are drawn by horses or mules that walk along the *tow path* at the side.

Naturally the country traversed by the canal is not perfectly level. Therefore provision must be made to prevent a current of water, and to keep all parts of the channel full enough to float the boats. For this purpose the canal is built in sections, each as level as possible, but not on the same level with the other sections, because the land is higher in some places than in others.

These sections are connected by *locks* (Fig. 142), which are small parts of the canal that can be shut or "locked" off from

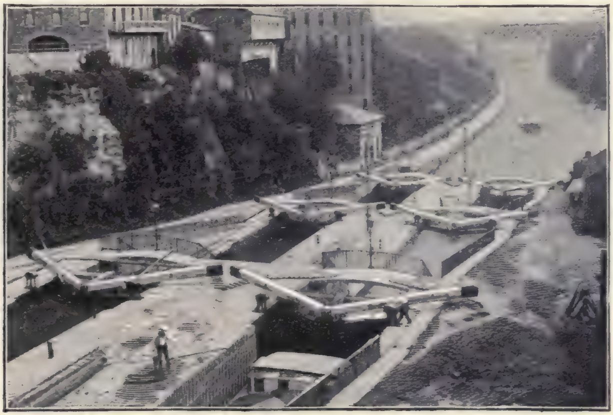


Fig. 142.

The locks in the Erie Canal at Lockport.

the other parts. A boat going westward needs to be lifted to a higher level at the end of each section. It therefore enters one of these locks and is shut in; then water is allowed to pour in from the higher part and fill the lock, thus lifting the boat until it can proceed on the higher level. If going eastward, the boat also enters a lock, the gates are shut behind it, and then water is allowed to flow *out* until the surface is brought

down to the lower level, when the boat proceeds on its journey, as before.

Before the Erie Canal was built PHILADELPHIA was larger than NEW YORK, and BUFFALO was only a small village (Fig. 143); but since the canal was completed, in 1825, both the latter cities have grown rapidly, while numerous others along the Hudson River and the canal have attained great importance (Fig. 141). They all have manufacturing industries and use the canal for obtaining

FIG. 143.
Buffalo in 1828.

such raw materials as coal and iron, and for shipping away the manufactured goods. Notice especially LOCKPORT, situated where there is a very decided slope in the land, necessitating many *locks* in the canal, hence the name.

Several other canals have been built in New York, as may be seen in Figure 141; point them out and explain their importance. The smaller lakes and the Hudson River are also made use of as a part of the canal system; but upon these larger bodies of water a number of canal boats are firmly lashed together and taken in tow by a small steamer or tug boat.

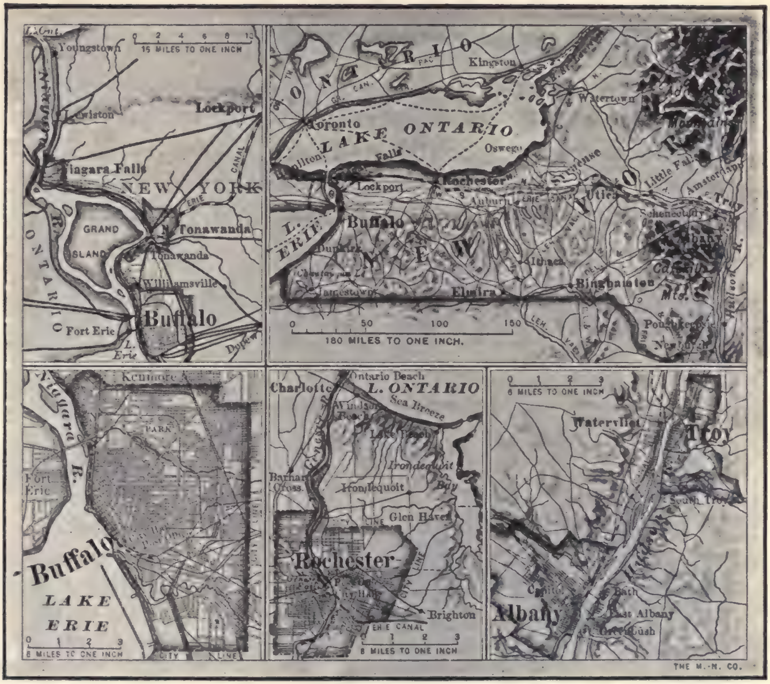


FIG. 144.

Map showing location of Buffalo, Rochester, and Albany.

Railways of New York. — Canals furnish a very slow method of conveyance; consequently, soon after the use of steam was discovered, men began to build railways. The New York Central Railway, one of the most important in the United States, extends from the very heart of New York City up the Hudson to ALBANY (Fig. 144), where it connects with Boston trains. From ALBANY westward to BUFFALO the route is almost the same as that of the Erie Canal.

Several other railways connect New York with the West, crossing the Appalachians at various points, and passing through BUFFALO, which is a great railway centre, as well as an important lake port (Fig. 144). At Buffalo immense quantities of grain, flour, lumber, and iron from the West are transferred from lake vessels to canal boats or railways, while coal and manufactured goods are shipped from the East westward.

The Niagara Falls (Fig. 125), about twenty miles away, supply BUFFALO with a great abundance of electric power. All the street cars are run by it, and many factories besides. Cars run by Niagara power go from BUFFALO to LOCKPORT and to the city of NIAGARA FALLS. The latter place has become an important manufacturing city because of the power furnished by the immense Niagara cataract.

FIG. 145.
A New York Ferry.

Since the Hudson River is about a mile in width at its mouth, most of the railways reaching New York from the West and South cannot *enter* the city. They have their terminus just across the river at HOBOKEN or JERSEY CITY in New Jersey. Because of this the latter city is one of the great railway centres of the country. From these points passengers and freight are conveyed across the river in *ferries* (Fig. 145), whole trains often being taken upon one boat.

Since the numerous railways now carry much of the freight that used to be given to the canals, the latter have

lost much of their importance, and there is even some talk of abandoning the Erie Canal.

New York City. — New York City is not only the greatest shipping point in North America, but, together with the neighboring cities, the greatest manufacturing centre as well. The place from which goods are most easily shipped in all directions is, for that very reason, one of the best places for manufacturing. Nearly every manufactured article that human beings need is made in or near New York; but one of the most extensive industries is the manufacture of clothing. Cotton and woollen goods are sent from the New England factories to New York to be made into such articles as dresses, men's suits, and underclothing, and then shipped away. Large buildings, in which hundreds of men and women are employed, are given up to this one work.

Iron and coal are so near at hand that the manufacture of iron goods is another great industry. The refining of petroleum is a third, the oil flowing in pipes from the oil fields of western Pennsylvania to great refineries in New Jersey near the metropolis. The refining of sugar is another immense business in and near New York, as at Jersey City and Brooklyn; and there are hundreds of other manufacturing industries. More books, magazines, and newspapers are published in New York than in any other city in the Union; and so much wealth is collected there that the New York banks largely control the great business undertakings of all parts of the country.

At the southern end of Manhattan Island, on which much of New York is built, there are about eight square miles of the city given up almost exclusively to the wholesale trade. For the sake of space many of the great office

FIG. 146.

Map to show the location of New York City and Philadelphia.

buildings are from eight to twenty-five stories in height. In this part of New York are collected such goods as are manufactured in the city or are brought to it from all parts of the world. Merchants in Denver, Louisville, St. Paul, Galveston, Indianapolis, and other cities, purchase these goods for their stores. In return the Western and Southern people send grain, meat, sugar, etc., to this great city. Thus we daily depend upon one another for our living, even though our homes are far apart.

FIG. 147.

One of the high buildings in lower New York. How many stories has it?

The contrast between life in New York City and upon a farm (p. 240) is striking. On some of the streets scarcely anything but stores can be seen for ten or twelve miles, many of them being small, but some occupying enormous buildings and employing many hundreds of clerks.

Families whose homes are in the city do not usually occupy a whole house; but many live in large buildings, in which hundreds of other people also live. Such a structure, called an apartment building, is commonly from six to eight stories high, and is so arranged that one family occupies only a small part of one floor, or a flat. Other families live above and below, as well as on each side, being separated from them by only a few inches of brick or boards. Since land is so valuable, sometimes costing scores of dollars a square foot, there is commonly neither front nor back yard. Indeed, excepting where a park

happens to be within reach, the street is almost the only place for children to play out of doors. A single apartment house may contain three hundred persons, or more than live in an entire village in many parts of the country.

In the poorer sections of the city the people are even more densely crowded. Some of the children have never seen the country, and scarcely any birds, trees, or grass, excepting possibly in one of the city parks. In these sections there are many foreigners from all the nations of the earth. There is much poverty among them, and many live in the midst of conditions that can scarcely be described, — filth, vice, and crime of all kinds prevailing.

FIG. 148.

New York City elevated railway skirting the border of one of the city parks.

To escape the necessity of living in crowded city homes, tens of thousands of men have their dwellings in suburban towns or country homes, from ten to forty miles from their places of business. They spend from one to three hours daily travelling back and forth. A part of the time they ride upon elevated railways that are built in the street, two, three, and four stories above the ground, and supported by iron columns (Fig. 148).

How different all this is from the country, where only two or three houses are to be seen at a time! Where sunlight and fresh air enter one's home from all sides of the building! Where there is plenty of room to play, with green grass, large trees, and singing birds in the yard! No wonder that people living in great cities are anxious to visit the country, the mountains, the lakes, and the seashore, during a few days in the summer.

Largely owing to the enormous population of New York City, with its immense manufacturing interests and great wealth, New York is called the Empire State, ranking first in the Union in population, manufacturing, commerce, and wealth (Figs. 322 and 352).

New York State is prominent for its educational institutions also. In New York City is Columbia University; and at Ithaca, on Lake Cayuga, in the central part of the state, is Cornell University. Both of these should be associated with Princeton University in New Jersey, and Harvard and Yale universities in New England, as among the most important educational institutions in the country. Besides this, north of New York City, on the Hudson River, is West Point, the place where the government school for the training of army officers is located. Also at POUGHKEEPSIE is Vassar, one of the great colleges for women, like Smith and Wellesley in Massachusetts, and Bryn Mawr near Philadelphia.

Philadelphia and its Chief Shipping Routes. — The leading cities southwest of New York are located along the fall line. Name them as far as Richmond (Fig. 123). The greatest is PHILADELPHIA, which is the third in size in the Union, containing 1,350,000 inhabitants. As in the case of New York, other important cities are near by, as TRENTON and CAMDEN, New Jersey, CHESTER and NORRISTOWN, Pennsylvania, and WILMINGTON, Delaware. Water deep enough for ocean vessels reaches as far inland as Philadelphia, and its nearness to the coal fields renders it a great shipping point for coal which is sent to New England and the Southern States.

As in the case of New York, numerous great railway lines enter Philadelphia, connecting it not only with the other cities of Pennsylvania, such as HARRISBURG, the

capital, and PITTSBURG, but also with the cities of the North, South, and West. Among these lines are the Pennsylvania Railway, and the Baltimore and Ohio, two of the greatest railways of the country. There are also many steamship lines from Philadelphia (Fig. 146).

A number of canals have been built in Pennsylvania, as in New York; but owing to the mountainous nature

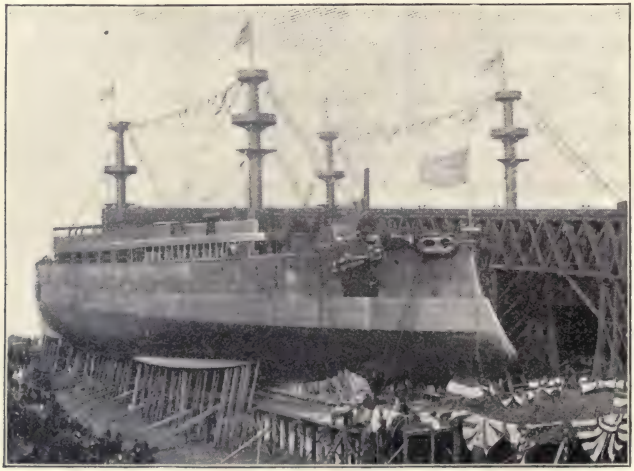


FIG. 149.
One of our great war ships ready to be launched.

of the country, there is no canal connection between Philadelphia and the Great Lakes. Therefore ERIE, the city in Pennsylvania which would most naturally compare with Buffalo, is much smaller; but being near the coal and iron, it is an important manufacturing city.

Philadelphia and the neighboring city of CAMDEN, being fine shipping points, are also great manufacturing centres. The coal and iron near by lead to the manufac-

ture of cars, heavy machinery, and steel ships (Fig. 149) at PHILADELPHIA and WILMINGTON. Great quantities of clothing are also made in Philadelphia, as in Boston and New York; and in carpet manufacture Philadelphia is the most important city in the country.

Philadelphia is called the Quaker City, having been founded by William Penn and other Quakers, many of whose descendants still live there. It was the home of Benjamin Franklin, and for a number of years, before Washington was built, it was the capital of the United States. Independence Hall is still preserved, in which the Declaration of Independence was made and the Constitution of the United States was drawn up. The leading educational institution there is the University of Pennsylvania.

FIG. 150.
Independence Hall, Philadelphia.

Baltimore. — At the head of Chesapeake Bay, in Maryland, is the beautiful city of BALTIMORE, the sixth in size in the United States. Since it has a good harbor, and is connected with the West by railways across the mountains (Fig. 151), and also has access to the coal fields of Pennsylvania and West Virginia, Baltimore has become a noted manufacturing city and shipping port, like Boston, Philadelphia, and New York. Like them, also, it has a multitude of manufacturing interests.

FIG. 151.

Map to show the location of Baltimore and Washington.

Baltimore is the seat of Johns Hopkins University; and a few miles south, at Annapolis, is the United States Naval Academy, which prepares officers for the navy, as West Point educates men for the army (p. 191). Still farther south in Virginia is Norfolk, an important shipping port for Virginia products.

District of Columbia. — Southwest of Baltimore, on the Potomac River, in the District of Columbia, is the city of Washington, our national capital (Fig. 151). When

Fig. 152.

The National Capitol, at Washington.

first set aside, this district was near the centre of the settled part of the country.

Washington is unlike other cities in two respects. In the first place, since there was a certainty that it would one day be very large, it was carefully planned, with wide streets and many parks; and these have since received so much care that this is now one of the most beautiful cities in the world.

In the second place, the inhabitants are not chiefly interested, as in other large cities, in manufacturing and commerce. Here reside the President and his cabinet, members of Congress, foreign ambassadors, and other representatives of the great nations of the world. Besides these there are about twenty thousand men and women engaged in the work of the different departments of the government. The chief buildings, therefore, are not factories and private office buildings, but great government buildings (Fig. 152). Also the topics for conversation pertain rather to the government than to matters of ordinary business.

QUESTIONS AND SUGGESTIONS

Review Questions and Topics. — (1) Describe the physiography of these states: — the Appalachian Mountains; the Piedmont plateau; the coastal plains; the fall line and its importance; the effect of the mountain barrier on westward migration; the effect of the glacier; the coast line. (2) Tell about the climate: — its variations, and their effects on crops and seashore resorts. (3) Tell about the forests: — where they are; what woods they contain; cities; forest reserves. (4) What fish are found along the coast? (5) Describe the oyster fishing. (6) What cities are noted for their oyster industry? (7) Where is farming carried on? What kinds? (8) Describe dairying. (9) Describe the tobacco industry: — the first use of the weed; where raised; at what cities manufactured; the tobacco plant; uses to which it is put; the effects. (10) Tell about fruit raising: — where carried on; kinds; uses to which each is put; cities that are greatly benefited by the industry. (11) State how farming and other industries are dependent on one another. (12) Tell about salt: — how formed; where found; how obtained. (13) State what you can about coal: — tell how coal was formed; how the two kinds differ; why some anthracite is left; to what uses it is put; how it is mined; the cities it has helped to locate; how the miners live. (14) Tell the story of petroleum and natural gas: — where found; how obtained; to what uses put. (15) Do the same for iron ore. (16) Describe the process of obtaining pig iron. (17) In what three forms is iron used?

Mention some of the articles made of each. (18) Name the principal cities engaged in the iron manufacture. Find each on the map. (19) In what ways are the farmers and the employees of the Osborn factory of use to one another? (20) Tell about each of the other kinds of manufacturing mentioned. (21) For what is each of the cities important? Find each on the map. (22) What large cities are near New York? (23) By what water route are New York and Albany connected? (24) New York and Buffalo? (25) Describe the Erie Canal:—its value; how boats pass over it; the cities it has helped to locate. (26) Why has Buffalo grown so large? (27) Jersey City? (28) Describe New York City:—its location; how it is connected with other sections; the industries; its influence upon other cities; how the people live; how they travel about; how their life differs from life in the country. (29) What universities are mentioned? Where is each? (30) Tell about Philadelphia:—why it has become so large; cities near by; other cities; other facts mentioned. (31) For what is Baltimore noted? (32) What cities near by? (33) What city in District of Columbia? What is the principal occupation of the inhabitants?

REVIEW BY STATES: *New York (N.Y.)*.—(1) Where are the mountains? (2) What are their names? (3) What are the industries there? Why not agriculture among the mountains? (4) What about the relief of the rest of the state? (5) What effect has that upon agriculture? (6) What waters form parts of the boundary of the state? (7) Into what rivers do the lakes empty? (8) What rivers drain New York? (9) State clearly the importance of the Erie Canal. (10) Which cities mentioned in the text are on the canal or on the Hudson? In what industry is each engaged? (11) What other cities of New York are mentioned? For what is each important? (12) Compare New York in size with all of New England. Remember that the scales of the two maps are different. (13) Draw a map of New York like that of Maine (p. 155). When studying each of the other states, do the same for it.

New Jersey. (N.J.).—(14) Why should peaches grow better in New Jersey than in New England? (15) Name and locate each of the cities mentioned in the text. For what is each important? (16) Make a list of the five largest cities in New Jersey, and compare them with the five largest in New York. (For their populations, see table on p. 448.) (17) In what ways are some of the largest cities dependent upon the products of Pennsylvania? (18) In what ways are some dependent upon the Erie Canal? (19) Add together the popu-

lations of all the large cities near New York (see map, Fig. 121) to see how large it would be if it could include those in New Jersey.

Pennsylvania (*Pa.* or *Penn.*). — (20) Where would you look for the best farm land? (21) The principal forests? (22) The leading coal mines? (23) Where are the principal cities? Why located where they are? (24) Make a list of the five largest cities, and compare their size with the five largest in New York and New Jersey. (25) Why are there fewer lakes in Pennsylvania than in New York? (26) Should you expect to find fewer waterfalls also? (See p. 17.) (27) Why, then, is manufacturing so important in this state? (28) What kind of manufacturing is especially important? Why? (29) What advantage do you see in the position of Pittsburg and Allegheny at the junction of two rivers? (30) Through what states would one pass in going by boat from Pittsburg to the Gulf? (See map, Fig. 97.) (31) Measure the length and width of Pennsylvania. Also find its area (p. 445). Remember that number, for in many of the maps of this book the outline of Pennsylvania is used to show the comparative size of other sections. (32) Is Pennsylvania larger or smaller than New York? Virginia? Maine? New England? (33) Is it larger or smaller than the state you live in? How much?

Delaware (*Del.*). — (34) Which is the principal city in this state? (35) For what is it noted? (36) Why is it especially well situated for this industry? (37) Compare its size with New York, Buffalo, Pittsburg, and Albany. (38) The principal industries of the state are fruit raising and farming. What two reasons can you give why it is well fitted for these? (39) Have you ever eaten any Delaware fruit?

Maryland (*Md.*). — (40) In which section is farming most important? Why? (41) Of what importance are the mountains? (42) Notice how branching Chesapeake Bay is. Why is it so irregular? (43) What influence should you think this would have upon the number of oysters found there? (44) Why is Baltimore favorably situated for receiving coal and iron from Pennsylvania? (45) For canning fruit, vegetables, and oysters? (46) What would be the effect upon the growth of Baltimore if the land should rise again so that Chesapeake Bay disappeared and the Susquehanna flowed through it? (47) Compare the size of Baltimore with Philadelphia, New York, and Boston.

Virginia (*Va.*). — (48) Richmond is the most important city. In what other state was the capital the most important? (49) Describe the tobacco industry. (50) Which cities are engaged in its manufacture? (51) What river separates Virginia from Maryland? (52) What

river crosses the middle of Virginia? (53) Compare Richmond in size with Boston. With Albany.

West Virginia (*W. Va.*) — (54) What disadvantage is it to this state that it has no seacoast? (55) How would we reach the ocean by water from West Virginia? (56) Where is the largest city? Why there? (57) How does it compare in size with Pittsburg? (58) Should you expect to find much forest in this state? (59) Much farming? (60) Coal, iron, petroleum, and natural gas are found there. Of what value are these? (61) What mountain range in eastern West Virginia.

General. — (62) Describe the surface features of this group of states from the relief map (Fig. 122). (63) Describe the differences in climate in the different parts. (64) State the principal industries of the Middle Atlantic States. (65) Make a list of the ten largest cities. Add their populations together, and compare the result with the ten largest in New England (see table, p. 448).

Suggestions. — (1) Collect pictures of Niagara Falls. Learn something about the use of Niagara power. (2) Examine a live oyster or clam, to see what holds the shells together. What do you suppose is the object of the shell? (3) The duty paid to the United States government on 1 pound of smoking tobacco is 12 cents. How much is that per ounce? (4) Find where the canned fruits and vegetables in your neighboring grocery store have come from. (5) Make a collection of the two kinds of coal. Of coke and iron ore. (6) In small bottles collect the products made from petroleum. (7) Collect samples of cast iron, wrought iron, and steel. (8) Estimate on the map (Fig. 97) the distance by water from New York City to Duluth. (9) Find the population in the ten largest cities along the Great Lakes by adding the numbers given on pages 448–453. (10) Visit a canal and examine a lock. (11) Make a toy canal having a lock in it. (12) Give reasons why freight rates on canals are cheaper than those on railways. (13) Make a list of goods that need to be shipped by rail on account of speed. (14) Write a composition, giving the reasons why one might prefer to live in a large city. Why one might prefer to live in the country. (15) Give some reasons why Richmond has not become a great city like Philadelphia. (16) Collect pictures of scenes in a large city; in the country. (17) Can you give a reason why the Erie Canal should have reached to Lake Erie instead of to Ontario? (18) Make a drawing of these states, including the principal rivers and cities. Locate the capitals.

For References, see page 440.

X. SOUTHERN STATES

Map Questions. — (1) In what three parts of this section are mountains found? (2) What are the names of the mountains? (3) Which states have no mountains? (4) What are the principal tributaries to the largest river of the section? (5) Through what states would you pass in going by water from New Orleans to Chattanooga? (6) Find some natural boundaries in this section. (7) Compare the coast with that of New England. Why the difference? (8) Why are there so few lakes? (9) The rivers that rise in western Texas — as the Colorado — are often perfectly dry in the western third of their course. Why? (10) Name the states in this group. (11) Find the capital of each. (12) Which of the states have a seacoast? (13) Which have none? (14) Which border the Mississippi? (15) Which drain into that river? (16) Can you give reasons why the largest city is near the mouth of the Mississippi?

Physiography. — Almost the entire area included in this group of states is made up of plains. The most level portions are the delta and flood plain of the Mississippi, and the coastal plains, which skirt the entire Gulf and Atlantic coast of the Southern States (Fig. 96). The coastal plains are very level; and, since the rainfall is heavy, they are often swampy, especially near the rivers. Their higher portions are more irregular and better drained; but, since the soil is sandy, there are large areas which are too barren for agriculture and are therefore still covered by an open pine forest.

West of the coastal plains that border the Atlantic, and separated from them by the fall line (Fig. 123), is the still higher Piedmont plateau, which extends to the base of the

105°
101°
97°
93°
37°
33°
29°
25°
Colorado Springs
Pueblo
COLORADO
Rocky Mts.
KANSAS
Kansas R.
Arkansas R.
Missouri R.
Topeka
Kansas City
Wichita
Cimarron R.
Springfield
Ozark Mts.
Eureka Springs
Santa Fe
Albuquerque
NEW MEXICO
OKLAHOMA
Perry
Kingfisher
Guthrie
Oklahoma
Canadian R.
Washita R.
INDIAN TERRITORY
Vinita
Tahlequah
Muscogee
Purcell
McAlester
Atoka
Tishomingo
Arkansas R.
Fort Smith
ARKANSAS
Little Rock
Hot Springs
Pine Bluff
White R.
Black R.
Ouachita R.
Red R.
Llano Estacado or Staked Plain
Denison
Sherman
Paris
Texarkana
Fort Worth
Dallas
Marshall
Tyler
Shreveport
Monroe
El Paso
Colorado
Corsicana
Palestine
Pecos
Pecos R.
Guadalupe Mts.
Rio Grande
Colorado R.
Waco
Brazos R.
Trinity R.
Neches R.
Sabine R.
Red R.
Mississippi R.
TEXAS
Alexandria
Austin
Brenham
Port Arthur
Lake Charles
Baton Rouge
Donaldson
Houston
San Antonio
Galveston Bay
Galveston
Nueces R.
Corpus Christi
Laredo
PADRE I.
GULF O
Lerdo
Monterey
Saltillo
Brownsville
Matamoros
MEXICO
Durango
Ciudad Victoria
Doctor Arroyo
Zacatecas
THE M/H. CO.
101°
97°
93°
0 50
Cities with
Cities with
Cities with
Cities with
Smaller Pla
Capitals wit
Capitals
Longitude

FIG. 153,

OUTHERN STATES
Scale of Miles
100 200 300 400
with 500,000 to 1,000,000: St.Louis
with 200,000 to 500,000: New Orleans
with 50,000 to 200,000: Savannah
with 25,000 to 50,000: Mobile
Places: Vicksburg
with less than 25,000: Tallahassee
itals of States: Other Cities:
gitude West 89° from Greenwich
89° 85° 81° 77°
37° 33° 29° 25°
INDIANA
ILLINOIS
OHIO
WEST VIRGINIA
VIRGINIA
KENTUCKY
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
ALABAMA
MISSISSIPPI
FLORIDA
ATLANTIC OCEAN
OF MEXICO
BAHAMA ISLANDS
CUBA
Cincinnati
Louisville
Evansville
Cairo
Richmond
Norfolk
Bristol
Knoxville
Nashville
Clarksville
Columbia
Jackson
Memphis
Chattanooga
Greensboro
Winston-Salem
Durham
Raleigh
Mt. Mitchell
Asheville
Charlotte
Newbern
Cape Hatteras
Pamlico Sd.
Roanoke R.
Wilmington
Cape Fear
Greenville
Columbia
Georgetown
Aiken
Charleston
Beaufort
Savannah
Augusta
Athens
Atlanta
Gainesville
Rome
Lookout Mt.
Macon
Columbus
Americus
Brunswick
Thomasville
Florence
Huntsville
Decatur
Aberdeen
Columbus
Anniston
Birmingham
Bessemer
Tuscaloosa
Selma
Montgomery
Eufaula
Meridian
Jackson
Vicksburg
Greenville
Natchez
Mobile
Mobile Bay
Pensacola
New Orleans
Lake Pontchartrain
Delta of the Mississippi
Tallahassee
Cape San Blas
Apalachee Bay
Jacksonville
St. Marys R.
St. Augustine
Palatka
Ocala
Cape Canaveral
Tampa
Tampa Bay
Lake Okechobee
The Everglades
Miami
Cape Sable
FLORIDA KEYS
Key West
Florida Strait
Havana
Nassau
Appalachian Mts.
Blue Ridge
Cumberland Plateau
Mississippi R.
Ohio R.
Tennessee R.
Cumberland R.
Chattahoochee R.
Flint R.
Altamaha R.
Savannah R.
Santee R.
Pedee R.
Cape Fear R.
Tombigbee R.
Alabama R.
Pearl R.
Yazoo R.
Coosa R.
Apalachicola R.
St. Johns R.
Chesapeake Bay
Wabash R.

153.

Fig. 154.

Relief map of the Southern States.

Appalachians. The Piedmont section has a good drainage and excellent soil, so that it is the seat of extensive agriculture, especially cotton and tobacco raising. This plain slopes gradually from the base of the Appalachians, where its elevation is about 1000 feet above sea level, to the fall line, where the elevation is from 100 to 500 feet above the sea. It is really a region of old mountains worn down to a rolling and, in places, slightly hilly plain.

On Figure 153 it will be seen that the Appalachian Mountains, with their rich coal beds, continue southwest

FIG. 155.

A peak rising above the forest-covered slopes of the mountains of western North Carolina.

from Virginia into Alabama. In the Southern States these mountains are generally low, as they are in the Middle Atlantic States; but in western North Carolina (Fig. 155) and eastern Tennessee the mountains are much higher. In fact, the highest peak east of the Mississippi River is Mt. Mitchell in North Carolina. It is 6711 feet in altitude, or 418 feet higher than Mt. Washington in New Hampshire.

As in Pennsylvania and West Virginia, there is a rough plateau west of the mountains. This plateau is deeply cut by river valleys, and is so rugged that it is still covered by extensive forests and has few inhabitants. Still farther west are the broad and fertile plains of the Mississippi Valley and of Texas. These are interrupted by some low mountains in Indian Territory, Arkansas, and Texas.

Fig. 156.

A view in the mountainous section of the extreme western part of Texas.

In western Texas the plains rise until they become high plateaus, reaching an elevation of 4000 to 5000 feet near the base of the southern spurs of the Rocky Mountains, which extend into Texas (Fig. 156).

The coast line is much more regular than that of New England. As has been stated (p. 20), this part of the continent has been raised instead of lowered. However, after the continental shelf was lifted enough to form the coastal plains, there came a slight sinking, though much less than in New England. This sinking has admitted the ocean waters into the valleys, forming shallow bays and poor harbors. Sand bars, built by waves and tides, have made these harbors even poorer; and each year large sums of money are spent by the government in dredging the sand away from the harbor entrances.

Bars are built, not only opposite the bays, but also where the storm waves break in the shallow water off shore. It is in this way that Capes Hatteras, Lookout, and Fear have been built, as well as the long chain of bars along the low southern

coast. The waves throw the sand up in banks, and the winds pile it still higher, forming sand dunes. These facts partly explain the reason why there are not so many large coast cities in the South as there are along the irregular, northern coast.

Still another kind of coast is found in southern Florida, where countless millions of coral polyps live in the warm waters of the Gulf Stream. These have built the limestone rock which forms the southern part of the Florida peninsula (p. 71), and also the many reefs and small islands, or *keys*, which lie just south of Florida.

Climate. — The low plains of the Southern States lie so far south that the climate is everywhere warm; and the damp winds from the Gulf bring an abundant rainfall to them. These conditions make it possible to raise cotton, sugar-cane, and rice, which cannot be grown in the colder Northern States. In southern Florida, which reaches farthest south, semi-tropical and even tropical fruits are easily raised. Among the Florida fruits are oranges (Fig. 170), lemons, pineapples (Fig. 157), cocoanuts, and bananas. What is the latitude of southern Florida?

Fig. 157.
The pineapple growing in Florida.

During the cold and disagreeable Northern winter, the Southern weather is mild, like spring and autumn in the North. Flowers are in blossom and birds are singing, many of them having migrated there for the winter. Large numbers of North-

ern people also go South to spend the winter at such resorts as Jacksonville and St. Augustine (Fig. 158), one of the early Spanish settlements. One of the important winter industries of the inhabitants is the entertainment of these visitors.

While Northern people travel South in winter to escape the cold, many Southerners go North in summer to escape the heat. Others summer among the high mountains, where the climate is cool, even in midsummer. The best-known mountain resort is Asheville in North Carolina. In some places, as Hot Springs, Arkansas, there are mineral springs, to which people resort to be cured of certain diseases.

Fig. 158.
A street in the quaint old town of St. Augustine, founded in 1565 by the Spaniards.

Western Texas has a different climate from the other parts of the South. Being in the horse latitudes (p. 49), and too far from the sea to be reached by damp winds, it receives little rain. The occupations are influenced accordingly. As one travels westward from the Gulf, he passes from the warm, damp coastal plains to a semi-arid country. At first there are dense forests; then come plains with scattered trees, especially the live oak (Fig. 159); beyond these are broad prairies without trees, but with extensive cotton fields. Next a section is reached which is too dry for cotton. It stretches westward for several hundred miles, and within it ranching is the only industry possible.

Forests. — Extensive areas in the Southern States are timber covered, and among the forests are found many

FIG. 159.
A live oak grove with the Southern moss hanging from the limbs.

trees unknown in the North, some of them, such as the magnolias, bearing large, sweet-scented flowers. There are forests not merely among the mountains, but also on the coastal plains, especially where the soil is sandy (Fig. 161). The method of lumbering is somewhat different from that in New England (p. 127). Instead of floating the logs down to tide water by means of the spring freshets, saw-mills are located in the midst of the forests, if possible on the river banks. To them the logs are brought, either by water, by wagon, or by train, and sawed into lumber.

FIG. 160.
A view in the swampy forest land of the plains of Florida.

The long-leaved or hard pine, often called the *Georgia pine*, which grows on the sandy coastal

plains, is much used for flooring in the North. It is shipped North from the coastal cities of CHARLESTON, South Carolina, SAVANNAH and BRUNSWICK, Georgia, JACKSONVILLE and PENSACOLA, Florida, and MOBILE, Alabama.

While the pine thrives on the low, sandy plains, the hardy oak and other trees are found upon the plateaus and among the mountains. Quantities of hard wood are shipped from MEMPHIS, Tennessee; but although much of the pine, oak, and other lumber is sent North, a great deal of it is manufactured into doors, blinds, furniture, etc., in the South, as at MACON and MONTGOMERY on the fall line, and at ATLANTA. There is also lumber manufacturing at the coast cities already mentioned, as well as in many other Southern cities.

FIG. 161.
A scene in the pine forest of the Southern coastal plains.

These forests are of value in two other ways. From them are obtained *turpentine*, and *tannic acid*, the liquid in which hides are soaked to make leather (p. 145). In the Northern States hemlock bark furnishes a tannic acid which gives the leather a red color, so that shoes made from it need to be blackened; but tannic acid from the chestnut oak of the South gives a lighter or tan color, and it is from such leather that tan

shoes are made. Thus, some of the shoe factories of the North are dependent upon the distant forests of the South. The tanneries of the South, on the other hand, are dependent upon the ranches of the West for their supply of hides.

Turpentine is manufactured from the sap of the pine tree. The bark is scraped off and the sap allowed to ooze out, somewhat as in the case of the sap of the sugar maple. This is then reduced to raw turpentine, to be used in paints, varnishes, medicine, tar, and other substances.

Agriculture

Although farming is carried on in all the states we have thus far studied, other occupations are followed by great

Fig. 162.

Negro homes in the cotton belt.

numbers of people. Give examples. In the South, however, with its excellent soil and warm climate, agriculture is the principal industry. Indeed, until recently, there was almost no other industry excepting commerce.

While the climate makes it possible to raise crops which cannot be grown in the cooler Northern States, some products are the same as those of the North. For instance,

tobacco raising, already described as an industry of great importance in Virginia, is also extensively carried on in Tennessee and North Carolina. DURHAM, in the latter state, is a centre for tobacco manufacturing. Name some Virginia cities engaged in the same industry.

Cotton. — The crop in the South that surpasses every other in value is cotton. The early colonists soon dis-

FIG. 163.

A quaint negro school in the South. Such schools are fast being replaced by better ones.

covered that cotton raising called for little skill, and that a ready market awaited the crop abroad. Their fields were far too large to be cultivated without many laborers, and negro slaves, offered for sale at that time in many parts of the world, were found especially suited to work in the cotton fields. In this way it came about that cotton had much to do with the spread of slavery in the Southern States.

The negroes were the property of the plantation owners, and on some of the larger plantations there were hundreds of slaves. In the North, where slavery had not been successful (p. 105), there arose a strong opposition to the system, and much bitter jealousy was aroused between the two sections, which finally

resulted in the Civil War. It is generally believed in the South that the result of the war was for the best, and the South is better off without the slaves; but the pity is that some less violent means was not found for doing away with the system.

It is owing to the system of slavery that there are now eight millions of negroes in this country. Among the mountains of North Carolina and other states, where cot-

FIG. 164.
Negroes picking cotton.

ton, rice, and sugar-cane cannot thrive, and where the farms have to be small, there are whole counties where there are almost no negroes; but in portions of some of the Southern States they far outnumber the whites. Most of the negroes still make their living by working in the cotton fields, for cotton is the principal crop all the way from North Carolina to Texas.

In 1898 the Southern States produced about 11,000,000 bales of cotton, each weighing nearly 500 pounds. Of this, about

FIG. 165.
A scene at a railway station in the cotton belt.

7,500,000 bales were shipped abroad, especially to England. The remainder was manufactured at home, particularly in New England and the South. In the same year the entire world produced a little over 17,000,000 bales, which makes it clear that the United States furnishes much more than half of all the cotton grown. When we remember that much of our clothing is made of cotton, it is evident that the Southern States make it their chief work to help clothe the various peoples of the world.

Cotton requires rather fertile soil and a long, warm summer with an abundance of rain. These conditions exist throughout the regions marked as the cotton belt in Figure 330; but, on account of the short summer season, they are wanting in the North. Explain why cotton is not raised in western Texas and among the Appalachian Mountains.

Cotton seeds are planted in the spring, in rows about three feet apart, and the weeds are kept out until the plants are nearly grown. They reach a height of about three feet, and develop large blossoms that produce a pod, in which the cotton and cotton seed are contained. On maturing, the pod bursts open, revealing a white woolly ball, known as the *cotton boll,* which in appearance resembles the downy substance in the thistle and in the pod of the milkweed.

When a great number of these pods have split open, a cotton plantation of five or six hundred acres presents a beautiful sight, — much like a field flecked with snow (Fig. 164). Then

FIG. 166.

Bales of cotton at a railway station in the South.

the busy season for the pickers begins. As many as two or three hundred negroes — men, women, and children — may assemble in one field, carrying bags and picking cotton, singing melodies, and chattering in the negro dialect the livelong day.

When plucked from the pods, the cotton is attached to seeds, and these must be removed before the cotton can be of use. The seedless cotton is tightly pressed into bales of about five hundred pounds, which are then covered with coarse jute bagging, bound with iron bands, and shipped away to the factories.

Rice. — This is one of the most valuable food products of the world, being the main support for millions of

people, as the Chinese, for example. Although it is not a staple food in the United States, nevertheless we do not raise even enough for our own use. Rice requires a warm climate and a damp soil, such as prevail on the low coastal and flood plains from the Carolinas to Texas. Although raised throughout that section, the largest quantity comes from Louisiana.

The influence of the rice industry upon slavery is well illustrated in South Carolina. Its cultivation on the swampy coastal plains, where malaria prevails, proved a deadly occupation to the white man, although negroes were able to live there. Thus it happened that the number of slaves increased at an enormous rate in the rice section, and shortly before the Revolutionary War they outnumbered the whites about three to one. There are now large numbers of negroes living on the damp coastal plains.

In the cultivation of rice, after preparing the ground, as for other grains, and planting the seeds, it is usually necessary to flood the fields from ditches. As the plant grows, it forms a slender stalk, upon the top of which appears a head of seed somewhat resembling a head of oats, and commonly reaching a height of from three and a half to six feet. Just before the harvest season the water is drawn off, so that horses may enter the field, and the grain is then cut and the kernels thrashed out, as in the case of wheat.

After the hull is removed, the grains are polished at such cities as New Orleans, Savannah, and Charleston, and are then ready for market. During the process of polishing, a white powder is ground off that is used for adulterating some foods, and also for making buttons. In some cases rice itself is used in making "pearl" buttons.

Sugar-cane and Sugar. — There are a number of plants from whose sap sugar is made. One of these, the sugar maple, has already been mentioned (p. 132); another is

the sugar beet, raised in great quantities in some of the European countries, and also, of late, in many parts of the United States. This beet is a very important source of sugar, because it can be raised in the cool temperate climate. For a long time, however, the principal source of sugar has been the sugar-cane, a plant that looks somewhat like corn.

Fig. 167.
A sugar-cane field in Louisiana, with the sugar houses in the background.

This plant requires a fertile soil and grows only in warm regions, where there is practically no frost even in winter. For this reason the greater part of the cane sugar comes from tropical lands, such as the Hawaiian Islands, the Philippines, Porto Rico, and Cuba (Fig. 332). In our own country the most noted sugar district is the delta and flood plains of the lower Mississippi in Louisiana.

In that section there are large sugar plantations, some of them having several thousand acres planted in sugar-cane. Either in the fall or spring, the cane is planted in rows about six feet apart, and a crop is raised every twelve months, being cut in the fall after the middle of October. The stalks grow to be two or more inches in diameter, and reach such a height that a man riding through them on horseback may easily be

entirely hidden from view (Fig. 168). As soon as the stalks are cut, they are drawn to the sugar house in wagons, or, on the larger plantations, in railway cars (Fig. 169).

There the cane is ground between rollers in order to squeeze out the juice, which is so acid that it must next be treated with lime. The waste cane, after the juice is pressed out, is used as a fuel to run the engines of the sugar house (Fig. 167), and the sap is placed in large vats and warmed to evaporate the water. As a result, two products are formed, — a thick black molasses, and brown sugar. Some large sugar houses produce as much as fourteen million pounds of sugar a year.

FIG. 168.

Negro women cutting the sugar-cane in Louisiana.

The crude sugar is sent from the sugar house to the refinery, either in NEW ORLEANS (Fig. 175), or in the North. At the refinery it is changed to white sugar by a complicated process, as a result of which the various grades of granulated, powdered, and lump sugar are produced. In changing the brown to the white sugar, burned bones, called bone black, are made use of to filter out the impurities. The bones are obtained from the packing houses of Chicago and elsewhere, where large numbers of animals are killed for meat.

FIG. 169.

Loading the sugar-cane on cars to be drawn to the sugar house.

The molasses is used for various purposes, some of it, especially in the West Indies, being consumed in the manufacture of rum. Molasses is a by-product, like sawdust in a lumber mill, and is not considered of much value by the sugar raiser.

FIG. 170.

Oranges in a Florida orange grove.

Fruits. — Fruits, such as watermelons, apples, peaches, pears, and grapes, flourish in the warm climate of the Southern States. Florida, however, is so far south that it has fruits of an entirely different kind. There are orange and lemon groves in many parts of the state; but in the northern part the trees have been greatly injured by frosts. During cold waves (p. 56), cool air from the North sweeps over the Southern States even as far as Florida, sometimes causing great destruction. Further south, where frosts never appear,

are found the more tender tropical plants, such as cocoanuts and pineapples (Fig. 157). The latter grow especially well on the low coral keys, the plant resembling an arid land plant with the pineapple nestled in the midst of sharp-pointed leaves.

Florida and other Southern fruits are sent in great quantities to the Northern States, where they appear in the markets early in the spring. Thousands of bushels at a time are shipped by fast train and steamer. They are sent together with early vegetables, and are intended for hundreds of cities and towns in the North.

Other Crops. — Many other crops besides those thus far named are raised in the South, corn and wheat being among the most important. An immense quantity of corn is produced, and over almost as wide an area as cotton itself; but since corn and wheat are raised so much more extensively in states farther north, where cotton will not grow, they are treated later (p. 243).

Peanuts and sweet potatoes are two important products of these states, particularly of North Carolina. Stock of various kinds, as horses, cattle, sheep, and hogs, is also raised, each plantation usually having some of these animals, as in other farming districts. In the open pine forests of the Florida and Georgia coastal plains, large numbers of cattle are raised.

An important animal in the South, and one which makes a strong draft animal well suited to a warm climate, is the mule. On the fertile plains, especially in Tennessee and Kentucky, much attention is paid to raising mules and fine breeds of horses.

Grazing. — In western Texas, where the rainfall is insufficient for agriculture, grazing is the chief industry. The climate is so dry that the grass cures and becomes hay while still upon the ground, thus offering such excellent food for cattle and sheep that ranching is a thriving business. One may travel for two or three hundred miles

westward over the plains, seeing little else than a ranch-house here and there, with an occasional herd of cattle or sheep, and cowboys riding to and fro.

Fig. 171.
Cattle on the Great Plains of the West.

While there is no reason for large cities in this section, and the life of the cowboys and sheep herders is a lonely one, it is their work that helps to supply our tables with meat and to cover our bodies with woollen clothing and with shoes. Explain how hundreds of New England families are dependent for their daily meat upon the products of these distant ranches. Here is a case in which the most densely populated section is intimately related to a very sparsely settled portion of the country.

Mineral Products

Coal and Iron. — Coal and iron ore constitute the principal mineral wealth of the South. These two minerals occur among the mountain ranges all the way from Pennsylvania to the Southern States. They are mined in several places, as near Chattanooga in eastern Tennessee; but the most noted of all is a district at the extreme end of the Appalachian system around Birmingham, Alabama. This region is so rich in these products that it now ranks as the second iron-producing section of the continent.

We learned that Pennsylvania enjoyed a great advantage in having iron ore and coal near together; but in

Birmingham even more favorable conditions are found. That city has grown up in the midst of a valley, around the margin of which are found iron ore, coal, and limestone, the three materials necessary for the production of iron and steel. In consequence, this section has become a great manufacturing centre.

Stone. — A large amount of building stone, especially granite and marble, is found in northern Georgia; and near Knoxville, in eastern Tennessee, much marble of different colors is quarried. What city in Vermont is likewise noted for marble? (p. 135.)

Gold and Precious Stones. — In the mountainous portion of western Georgia and North Carolina there is a gold-producing belt which formerly yielded much gold, and from which some is still obtained. Occasionally, too, precious stones, as sapphires and diamonds, are found among the gravels.

Phosphates. — The soil of farms often becomes worn out and needs a fertilizer. There are various kinds of fertilizers, such as manure and bone-dust, which furnish the plant-food needed by the crops; but one of the most important fertilizers is mineral phosphate. This is found in great quantities in Florida and in Charleston harbor. It is a deposit in which are found fossil remains of many animals, such as the teeth of sharks, and the bones and teeth of many large land animals. Among the latter is the huge mastodon, which lived in this country long before white men came. This fertilizer is so valuable that it is shipped to the Northern States from Charleston, Jacksonville, and Tampa, to be used on the farms.

Manufacturing

Birmingham, the leading manufacturing centre of the South, is located on an old cotton plantation. In 1880 it had a population of 3,086; but it now contains sixty thousand persons. What special advantage has it? In this

city, as in Pittsburg and Allegheny, the iron ore is reduced to iron in blast furnaces (p. 176), and then changed to steel and various other useful articles. Several other cities near the mountains are also noted for their iron manufacturing, as Rome and Atlanta, Georgia, and Knoxville and Chattanooga, Tennessee.

Before the war there was very little manufacturing in the South. One reason for this was that water power is not common there, and another that the negroes, who did most of the manual labor, lacked the training necessary to handle machinery. At that time nearly all of the slaves were unable to read or write; but now only about half of the colored people are illiterate. The raw materials were shipped away, and manufactured articles brought back.

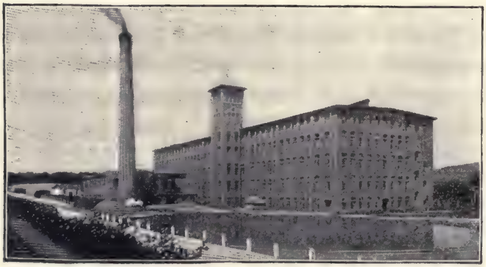


Fig. 172.
A cotton factory at Huntsville, Alabama.

Thus the cotton went to England and New England, some of it to be returned in the form of clothes; and the lumber was shipped to various Northern cities to be sent back in the form of furniture. The iron ore was not mined at all.

This situation is now fast changing. Since the war the Southerners have become engaged more actively in labor; many Northerners have moved into the South, and the negroes have been advancing. The South is awakening to its great opportunities, and the hum of factories is now heard in many places. The iron industry is already

well developed, and each year new cotton mills are being erected.

Some idea of what one of these cotton mills means may be gained from a certain one in Alabama. It employs 600 hands, including men, women, boys, and girls, and pays them about $2000 per week in wages. Each day this mill consumes 15 bales of cotton, averaging about 500 pounds; and since the average yield per acre of land is about 250 pounds, you can easily estimate about how many acres of cotton are called for in one year by this one mill. White people are employed because many employers hold that the negroes lack the intelligence and application necessary for such work. But in some places employers are beginning to hire the negro.

Texas raises more cotton than any other state, but most of it is still shipped away. In that state, in 1897, there were only four cotton mills, while North Carolina had about 200. Nor is there much cotton manufacturing in Arkansas, Mississippi, and Louisiana.

Formerly the cotton seeds were slowly picked out of the cotton by hand, and then thrown away. Whitney's invention of the Cotton Gin,[1] in 1793, enabled one laborer to separate from the seed as much as 1000 pounds in the time that was formerly required to clean five or six by hand. That, of course, made cotton raising far more profitable, and had an immense influence upon the amount produced, as well as upon the number of slaves needed.

Instead of being thrown away, the cotton seeds are now saved. There are two or three pounds of seeds to one pound of fibre; and since one acre, on the average, produces about 250 pounds of seedless cotton, the quantity of seed from a 600-acre plantation is very large. It was an immense loss when the seeds were thrown away; but now a kind of oil, called *cotton-seed oil* is

[1] **Gin is merely an abbreviation for engine.**

extracted from them, which is used in making soap, imitation butter, and a substitute for olive oil. Further than that, the part of the seed that is left after the oil is pressed out, has been found to be an excellent food for cattle and a good fertilizer.

FIG. 173.

Bags of cotton being hoisted into a building to have the seed removed by the cotton gin.

While hundreds of Southern cities and towns now manufacture cotton cloth and cotton-seed oil, the most noted are COLUMBIA and GREENVILLE, South Carolina, CHARLOTTE, North Carolina, and AUGUSTA, COLUMBUS, and ATLANTA, Georgia. What cities in New England are likewise noted for cotton manufacture? How do they compare in size with these? (See tables, pp. 448–453.)

Some of the other articles manufactured in the South have already been mentioned, as furniture and other objects from wood (p. 207), tobacco (p. 209), and sugar (p. 215). In each case this work is confined mainly to the section in which the raw material is raised. For example: NEW ORLEANS, in the midst of sugar plantations, has large sugar refineries; MACON, MONTGOMERY, MOBILE, CHATTANOOGA, MEMPHIS, and LITTLE ROCK, all in the neighborhood of forests, produce lumber and furniture; and RALEIGH, DURHAM, and other cities in northern North

Carolina, manufacture tobacco. Which of the manufacturing cities mentioned are on the fall line? (Fig. 123.)

Another section of the South is also noted for its tobacco factories, namely, Key West, on a small coral key, south of the Florida peninsula. It is so near Cuba that the Havana tobacco, so much prized by cigar smokers, is easily obtained. There is also cigar manufacturing at Tampa. Why there?

Leading Cities and Shipping Routes

The *largest* cities so far studied have been located at points on the water where the shipping advantages are superior, and where numerous factories have consequently located. Give examples. For reasons already mentioned, the Southern States have not so many fine harbors as the Northern States (p. 20). Besides that, although many factories have recently been built, the people are still mainly engaged in farming. On these accounts we cannot expect to find so many or so large cities as in the North; and most of those that do exist may be looked for either on the Mississippi River or on the coast.

New Orleans. — The greatest of all Southern cities is New Orleans, the largest city in the United States south of St. Louis. It has a population of nearly 300,000, or more than half as many as Boston, and is therefore the twelfth in size in the United States. When we recall the advantages of New York's water connection with the West, we can readily explain the growth of New Orleans. Pittsburg on the Ohio, St. Paul on the Mississippi, and Kansas City on the Missouri, may all be reached from New Orleans by boat (Fig. 97). How do these distances compare with those from New York to Chicago and to Duluth? Also how far apart are Pittsburg and Kansas City?

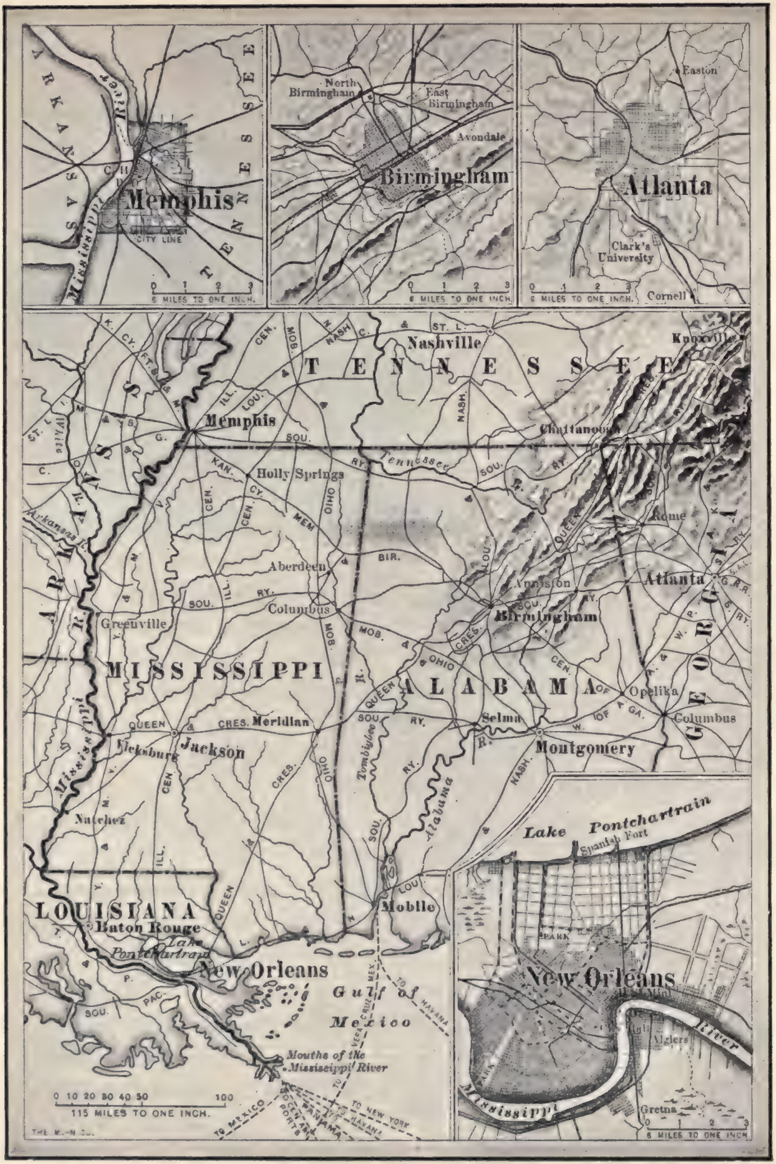


Fig. 174.

Map to show location of New Orleans, Memphis, Birmingham, and Atlanta.

New Orleans is situated at the gateway to the most productive valley in North America. The city is located about 100 miles from the mouth of the Mississippi, at a point to which ocean vessels can ascend, although they dare not venture much beyond it. On the map (Fig. 174) you will see that an arm of the sea, called Lake Pontchartrain, reaches up to the city, and that New Orleans is located at the place where the river and lake are nearest

FIG. 175.

Loading a river steamer at the levee in New Orleans. A large sugar refinery is seen in the distance, on the left.

together. The stream there makes a bend in the form of a half-circle, which explains the reason for the name of CRESCENT CITY, commonly applied to New Orleans.

That particular spot was selected because the sail boats of two centuries ago could reach it by crossing the lake, while they could not sail a hundred miles up the river without great difficulty. The large ocean steamers now in use cannot enter the lake on account of the shallow water,

but must reach the city by the river route. This they can easily do, since they depend upon steam instead of wind.

Much of the land on which New Orleans rests is frequently below the level of the river. In fact, from Memphis southward, the land on either side of the river is nothing but a low flood plain, spreading out for many miles, and often threatened with floods. The mighty river, receiving tributaries from regions thousands of miles apart, is charged with yellow mud, which gradually sinks to the bottom as the current becomes slower toward the mouth. This has built up the bed of the river, so that at high water the floods would spread over the broad flood plains if these were not protected by strong walls of earth, called *levees.* In spite of their strength, these embankments occasionally give way, especially in the springtime, when the snows are melting in the North; then the destruction to life and property is appalling. At such times, hundreds of men patrol the levees night and day to check the slightest leak. Even a hole made by a crawfish may be the beginning of an awful inundation. Why?

Fig. 176.

A view in a cemetery in New Orleans, where the ground is so wet that the dead must be placed in stone tombs above ground.

Some peculiar consequences result from this condition. The soil on which New Orleans stands is naturally very wet. Indeed, in digging foundations for buildings, water is reached a short distance below the surface. On that account, there can be no cellars under the houses, and it is difficult to provide proper drainage.

Since the city once belonged to France (p. 98), French is still a common language there, one person in six being of French stock. About one person in four is colored.

Since frost seldom reaches this city, the midwinter weather is rarely colder than the occasional frosty, early autumn evenings of the North. What must be the effect of this climate upon the style of houses? Also upon the presence of birds, flowers, and fruits in winter, and the appearance of the trees?

Knowing the farm products in this region, we have a key to the exports from this point. New Orleans is an important cotton market and a centre for sugar, molasses, and rice, besides being a shipping point for products from farther up the Mississippi Valley.

Like New York, this city is now connected with the distant interior cities by rail as well as by water. The Illinois Central Railway extends all the way to Chicago, running parallel to the river for much of the distance; the Louisville and Nashville reaches Louisville and St. Louis; and the Southern Railway runs most of the distance from New Orleans to Washington, connecting with the Southern Pacific, which extends westward, across Texas, to California.

Memphis and Atlanta. — The cities next in size are MEMPHIS and ATLANTA (Fig. 174), each having about one hundred thousand inhabitants. The former is situated in Tennessee, on a bluff where the Mississippi River swings out upon its broad flood plain. Why is that a favorable location? Memphis is one of the great cotton centres and lumber markets of the South.

Atlanta, the "Gate City," is one of the few large cities not located upon a water route. Northeast of it, for over 350 miles, there is no easy pass across the mountains; and until 1880 no railway crossed the mountain ranges in all that distance. Near where Atlanta stands, however, there is a good route; and railways reaching

westward from the Carolinas or northern Georgia come together there, making Atlanta a great railway centre. Cotton and tobacco are two of its leading articles of trade, and the iron industry is also important, since the city is not far from the Birmingham iron mines.

Other Cities. — Recalling the rough nature of the plateaus west of the Appalachians, we can see the reason for the location of CHATTANOOGA. It is on the Tennessee River at a point which makes it a gateway in much the same sense as Atlanta. It is on this account that Chattanooga was such an important point during the Civil War, as was Atlanta also.

NASHVILLE, the capital of Tennessee, has saw-mills, furniture factories, and flour-mills. Being in the midst of a splendid farming country, it is a distributing point for supplies to the neighboring towns and farms. It is also one of the educational centres of the South, having Vanderbilt University and other important schools. There are several other well-known universities in the South.

Name the leading coast cities of the Southern States. They are chiefly engaged in shipping cotton and lumber, and most of them are located near the mouths of rivers, so that their goods may be brought to them by water as well as by rail. The two best known are CHARLESTON and SAVANNAH, both noted shipping points even before the Civil War. In Florida is located TAMPA, a port from which steamboats go to Cuba.

Since cotton is raised to be shipped away, there has been need of a large number of small shipping ports along the rivers and coast. Therefore, besides the cities already named, most of which are extensively engaged in cotton shipping, we find the cotton ports of VICKSBURG, NATCHEZ, and BATON ROUGE, on the Mississippi, and SHREVEPORT and LITTLE ROCK on tributaries to that river.

Texas. — This state is the largest in the Union. Find how it compares with New England in size (Fig. 97). The western third of the state, as was stated on page 205, is fitted mainly for grazing, although there is some mining in the mountains. Throughout that entire section there are no cities and almost no large towns, except in the extreme western corner, where EL PASO is situated. The word El Paso means "the pass" in Spanish, for this city is situated at a pass in the Rocky Mountains, through which the Southern Pacific Railway passes westward, while an important line extends southward into Mexico. El Paso is at one of the gateways into Mexico and is therefore an important railway centre.

East of the arid and semi-arid plateau is the fertile cotton belt. In this there are many cities, such as DALLAS and FORT WORTH — both shipping points, not only for cotton but also for cattle from the Western plains. Dallas is also a busy manufacturing city. AUSTIN, the capital, is a beautiful city on the Colorado River, and SAN ANTONIO is a quaint Mexican town; for Texas once belonged to the Mexicans, but declared its independence in 1836, after which (1845) it was taken into the Union.

Two of the largest cities of Texas are HOUSTON, near the coast, and GALVESTON, the principal seaport west of New Orleans. Immense quantities of cotton and other products are shipped from Galveston. It is also a port of outlet for goods from the Far West.

The Territories. — We have already learned something about the Indian Territory (p. 103). There is much mineral wealth in this territory; but, owing to the fact that the Indians own the land, little can be done to develop it at present.

Oklahoma, like Texas, is mainly a great plain, arid in the western part, but in the eastern half a fertile, agricultural district. The principal products are corn in the north and cotton in the south. It was formerly a part of the Indian Territory, but in 1890 was opened to settlers. Since then its growth has been so marvellous that almost all the farm land is now occupied and tilled, although none of the farm buildings are so old that the shingles have lost their newness. There are two flourishing cities, — OKLAHOMA and GUTHRIE, — and the territory already has enough inhabitants to warrant its request to be admitted as a state.

FIG. 177.
Scene on an Indian reservation.

QUESTIONS AND SUGGESTIONS

REVIEW QUESTIONS AND TOPICS. — (1) Describe the physiography of these states: — the plains and their products; the mountains; the Texas plains; the coast — its bars, harbors, and coral keys. (2) Tell about the climate: — how it differs from the North; the climate of the mountains; the crops; the winter resorts; the summer resorts; the arid section. (3) How do the forests and methods of lumbering differ from those of Maine? (4) Which cities have important lumber industries? (5) What besides lumber is obtained in the forests? (6) What about tobacco raising in the South? (7) Tell about cotton: — the effect in encouraging slavery; amount produced; where grown; method of planting and picking. (8) Do the same for rice; and tell, also, what it is used for. (9) Describe the sugar industry: —

source of sugar; where the sugar-cane grows, and why; method of planting and harvesting; change to sugar,—where done, methods employed, and products obtained. (10) What fruits are raised in the South? Why there? What is done with them? (11) What other crops are important? (12) Where is grazing carried on? Why there? How are we dependent upon these ranchmen? (13) Where are coal and iron found? (14) What great natural advantages has Birmingham? (15) What other mineral products are obtained? (16) Tell about the phosphate:—where found; origin; uses; from what ports shipped. (17) Where is iron manufacturing carried on? (18) Tell about manufacturing in the South:—former condition; present change; importance of a single cotton factory; the cotton gin; uses of cotton seed; cities engaged in cotton manufacturing; cities engaged in other manufacturing. (19) Why are there not so many large cities in the South as in the North? (20) Tell about New Orleans:—the reason for its importance; why located just where it is; the need of levees; the inhabitants; the climate; the industries. (21) For what are Memphis and Atlanta important? (22) Chattanooga and Nashville? (23) What about the river ports? (24) The seaports? (25) Tell about Texas:—its size; industries; principal cities. (26) Tell about the two territories.

REVIEW BY STATES: *North Carolina* (*N.C.*).—(1) Which part is mountainous? Name and locate the highest peak in the East. (2) What two plains in this state? (3) Which cities are mentioned in the text? Where is each? For what important? (4) What capes on the coast? (5) What are the industries? (See Figs. 324–349.) (6) Draw an outline map of this state like that of Maine; and later do the same for each of the other states.

Tennessee (*Tenn.*).—(7) Where are the mountains? The plains? (8) Name two cities among the mountains. For what is each important? (9) Answer the same question for two other cities in Tennessee. (10) Which city is the largest? (See table, p. 448.) (11) What large river drains the state? Through what two large tributaries? (12) What industries in this state?

South Carolina (*S.C.*).—(13) Describe the physiography of this state. (14) What are the principal industries? (15) What city on the fall line? On the seacoast? For what is each important? (16) Which city is largest? (See table, p. 448.)

Georgia (*Ga.*).—(17) Where are the mountains? (18) The plains? (19) What are the industries in each section? (20) Trace the fall line across the state (Fig. 123). What cities are on it? (21) Why is

Atlanta situated where it is? (22) How does it compare in size with the largest city in the three states just mentioned? (23) How does it compare in size with New Orleans, Boston, Buffalo, and Providence? (24) Name the two seaports. What do they ship?

Florida (*Fla.*) — (25) Why are there so many lakes in Florida? (See p. 21.) (26) What about the relief? (27) What about the climate? How does this influence the crops? (28) What Florida cities were mentioned, and for what is each important? (29) What mineral product comes from Florida? (30) What is the principal industry at Key West? Why? (31) What group of islands lies east of the southern end of Florida?

Alabama (*Ala.*). — (32) Trace the fall line across this state. What cities are situated on it? (33) Where is Mobile? For what is it important? (34) Describe the location and industries of Birmingham. (35) What crops are raised in Alabama? (36) What cities are engaged in manufacturing cotton? (37) In lumber manufacturing? (38) Compare Mobile in size with Atlanta and Birmingham.

Mississippi (*Miss.*). — (39) Why is there no seaport? (40) In what way can the products of the state be shipped by water? (41) From what cities? (42) What are the products? (43) Why no mining? (44) What reasons can you give why there is so little manufacturing?

Louisiana (*La.*). — (45) State the reasons for the great importance of New Orleans. (46) Why has it a better location than Mobile or Charleston? (47) Compare it in size with those cities. (48) With New York, Boston, and Baltimore. (49) What large tributary enters the Mississippi in Louisiana? (50) What crops are raised in Louisiana? Why there? (51) Tell how the delta is caused to grow.

Arkansas (*Ark.*). — (52) What large river enters the Mississippi in this state? (53) There is considerable forest in Arkansas. In what part should you expect to find most of it? (54) Is Arkansas in the cotton belt? (See Fig. 330.) (55) The capital is the largest city. Compare it in size with Memphis. Why is it less favorably situated than that city? (56) Compare it in the same way with New Orleans.

Texas (*Tex.*). — (57) Where are the mountains? (58) Are there forests on the western plains? Why? (59) What are the industries there? (60) What city in the western part? Why there? (61) What are the industries in eastern Texas? (62) What cities are mentioned in the text as being in eastern Texas? (63) For what is Galveston noted? (64) Compare it in size with New Orleans, Charleston, and Boston. (65) What products should you expect to find sent from here? (66) How many times larger than Rhode Island is Texas?

(For area, see table, p. 445.) Than Pennsylvania? (67) Add together the areas of all the New England and Middle Atlantic States, and compare the total with the area of Texas. (68) Compare the population of Texas with that of Massachusetts (see table, p. 445). Compare it with that of New York City (see table, p. 447).

Indian Territory (*I.T.*). — (69) What disadvantages do you see in the fact that this region is owned by the Indians? (70) Describe an Indian reservation (see p. 103).

Oklahoma (*Ok.*). — (71) What about the climate of the western part? (72) What crops are raised in the eastern part? (73) Into what river does the territory drain? (74) Name the two cities.

General. — (75) Which is the smallest state? (76) Compare it with Pennsylvania and Massachusetts. (77) State the principal industries of the South. (78) Of what advantage is it that they are so different from those of the North? (79) Add together the populations of the ten largest cities, and compare the result with the total for the ten largest in the New England States (see table, p. 448). In the Middle Atlantic States.

Suggestions. — (1) Examine a floor made of Georgia pine. (2) Show several ways in which New England and the Southern States are dependent on each other. (3) What would be the effect on the cotton manufacturing of England if the United States engaged in war with that country? (4) Find what the effect was at the time of the Civil War. (5) Near what places were some of the great battles of the war fought? (6) What other inventions may well be compared with that of the cotton gin in importance? (7) Try raising some rice in the schoolroom. (8) Raise some tobacco, cotton, and sugar-cane. (9) About how much sugar does your family use each year? (10) Explain more fully why the cultivation of rice is unhealthful work. (11) Examine a pineapple. (12) Find some pictures of orange and lemon groves. (13) What reasons can you give for expecting the cotton mills in New England to prove less profitable, now that the South is developing such mills? (14) Find out how much farther it is from New Orleans to London than from New York. What effect should you think its greater distance from Europe would have on the growth of New Orleans? (15) Through what waters would a boat go from New Orleans to Kansas City? To Pittsburg? To Chicago? To San Francisco? (16) Make a drawing of the Southern States, putting in the chief rivers and cities.

For References, see page 440.

XI. CENTRAL STATES

MAP QUESTIONS. — (1) Name the large rivers of this group. Draw a sketch map showing them. (2) Draw a sketch map of the five Great Lakes. (3) Locate upon each of those sketches the cities printed in large type (those over two hundred thousand inhabitants). (4) Are any of the very large cities not situated on rivers or lakes? Why? (5) What advantages have these cities from their location? (6) Examine Figure 13 to see how far the glacier reached in these states. Do you find any lakes south of that line? (7) What influence must the Great Lakes have upon the summer climate of places near them? Upon the winter climate? (8) Compare the isothermal charts (Figs. 63 and 64) with the map (Fig. 178) to see near what cities the isotherms pass. (9) Why is the interior colder in winter and warmer in summer than the coast? (10) State some ways in which the Great Lakes must have influenced the development of the West.

Physiography and Climate. — A hundred years ago, when a considerable number of pioneers pushed across the Appalachian Mountains into Ohio and Kentucky, they were gladdened by the sight of immense tracts of level land. For hundreds of miles the plains slope gently toward the Mississippi; and then, beyond that river, they slowly rise again for hundreds of miles to the very base of the Rocky Mountains. In a few places, as in western South Dakota and southern Missouri, low mountains rise above the plains; but most of the country is a vast level tract, quite unlike the hilly and mountainous region farther east. What are the names of the mountains of the Central States? (Fig. 178.)


DOMINION OF
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
MINNESOTA
IOWA
MISSOURI
MONTANA
WYOMING
COLORADO
NEW MEXICO
TEXAS
OKLAHOMA
IND. TER.
ARKANSAS
Turtle Mts.
Lake of the Woods
Rainy Lake
Red Lake
Lake Itasca
Leech Lake
Mille Lacs
Black Hills
Ozark Mts.
Devils Lake
Grafton
Grand Forks
Crookston
Tower
Mandan
Bismarck
Jamestown
Fargo
Duluth
Superior
Ashland
Wahpeton
Fergus Falls
Brainerd
Aberdeen
St. Cloud
Watertown
Stillwater
Deadwood
Lead
Pierre
Huron
Minneapolis
St. Paul
Eau Claire
Red Wing
Faribault
Mankato
Winona
Mitchell
Sioux Falls
Yankton
Mason City
Sioux City
Fort Dodge
Dubuque
Norfolk
Marshalltown
Cedar Rapids
Fremont
Des Moines
Davenport
Muscatine
North Platte
Omaha
Council Bluffs
Grand Island
Plattsmouth
Ottumwa
Burlington
Kearney
Hastings
Lincoln
Nebraska City
Fort Madison
Keokuk
Beatrice
Quincy
Atchison
Leavenworth
St. Joseph
Chillicothe
Hannibal
Kansas City
Moberly
Topeka
Lawrence
St. Louis
Sedalia
Jefferson City
Ottawa
Emporia
Hutchinson
Wichita
Fort Scott
Nevada
Pittsburg
Parsons
Carthage
Joplin
Springfield
Arkansas City
Missouri R.
Mississippi R.
Red River of the North
Souris or Mouse R.
Sheyenne R.
James R.
Minnesota R.
St. Croix R.
Des Moines R.
Cedar R.
Grand R.
Little Missouri R.
Cheyenne R.
White R.
Niobrara R.
Loup R.
North Platte R.
South Platte R.
Platte R.
Republican R.
Solomon R.
Smoky Hill R.
Kansas R.
Arkansas R.
Neosho R.
Osage R.
Cimarron R.
105°
101°
97°
93°
45°
41°
37°
Longitude
THE M.-N. CO.

FIG. 17


CENTRAL STATES
Scale of Miles.
0 25 50 75 100 200 300
Cities with over 1,000,000: . . . . Chicago
Cities with 500,000 to 1,000,000: . . St. Louis
Cities with 200,000 to 500,000: . . . . . Buffalo
Cities with 50,000 to 200,000: . . . . . . Toledo
Cities with 25,000 to 50,000: . . . . . . Lexington
Smaller Places: . . . . Alpena
Capitals with less than 25,000: . . Charleston
Capitals of States: ◎ Other Cities: •
CANADA
LAKE SUPERIOR
LAKE MICHIGAN
LAKE HURON
LAKE ERIE
LAKE ONTARIO
ONTARIO
MICHIGAN
ILLINOIS
INDIANA
OHIO
KENTUCKY
WEST VIRGINIA
VIRGINIA
PENNSYLVANIA
NEW YORK
NORTH CAROLINA
TENNESSEE
Chicago
Milwaukee
Detroit
Cleveland
Toledo
Buffalo
Pittsburg
Allegheny
Toronto
Cincinnati
Louisville
Indianapolis
Columbus
Grand Rapids
Fort Wayne
Nashville
West 89° from Greenwich

Fig. 178.

Fig. 179.

Describe the relief of this section.

Not only did the settlers find the land level, but most of it was free from forests and boulders. In many portions of New England weeks of hard labor were required to remove the trees from a single acre, and many days to drag away or bury the boulders. On the broad plains, however, such labor was unnecessary, for there were hundreds of thousands of square miles covered only with grass. These treeless plains became known as the *prairies.*

Possibly at one time the prairies of the Mississippi Valley were largely wooded; but frequent fires, started by the Indians in order to frighten the bison (Figs. 71 and 76) and other wild game from cover, and drive them to places where they might be slaughtered, had cleared away much of the forest. Even since white men have settled in Kentucky, the Indians have removed some of the forest in this manner.

While boulders are abundant in some places, the glacier has in most sections left a deep, rich soil, free from stones. The reason for this is, that here the glacier found softer rocks to grind up into soil than in New England, and was therefore more easily able to reduce them to small fragments. In many sections, as in parts of Illinois, Indiana, and Ohio, the glacial drift is one or two hundred feet deep. It is the deposit of this drift which has caused the thousands of lakes in Minnesota and other states.

The summers are too short for cotton, but they are long and hot enough for numerous other crops. The rainfall is also sufficient for crops, except in the extreme western part, which is arid, like western Texas (p. 205).

Settlement of the Mississippi Valley.—The conditions seemed favorable for agriculture; and, in spite of danger from Indians, the settlers poured across the gaps in the mountains, following the Great Lakes or the Ohio River

and its tributaries. At first only a few ventured in, travelling until they reached a spot which suited their fancy. There they built rude log huts, and settled down to a solitary existence, one family being perhaps miles away from its nearest neighbor.

As more persons came and wished to proceed farther westward, they built flatboats to navigate the rivers, and they settled in groups along the river banks, forming villages which soon grew into towns and cities. Their life was of the simplest kind, each family depending largely upon itself for whatever it needed (First Book, p. 82). Some articles had to be purchased; for though the rich soil produced abundant crops, the pioneers still needed sugar, cotton cloth, tools, and medicines. Since almost all this region drained into the Mississippi, the most accessible place where such supplies could be obtained was New Orleans. Consequently the products of the farm were floated on flatboats to that point, and there sold or exchanged for the articles desired.

A great improvement was made when steam came into use. The first steamboat on these Western rivers was the *New Orleans,* which started out from Pittsburg in 1811. "As it ran down the Ohio, making extraordinary speed in comparison with anything before known, the quiet denizens of the forests along the river banks were amazed and frightened by the strange apparition. Not a few of the more ignorant folk thought the Day of Judgment was at hand, as they watched the showers of sparks and heard the rush of the wheels. And when the craft stopped at Louisville, well along in the night, and let off steam, the roar from the escape-pipes brought a good share of the town tumbling out of their beds to see what was the matter."[1]

[1] "The United States of America," by N. S. Shaler, Vol. I, p. 296.

Canals, similar to the Erie Canal in New York (p. 182), were also made, and the benefits of another invention began to be felt in 1827. In that year the first railway was built in the United States; and, as years passed, railway lines were so extended that even those regions that were at a distance from the rivers could be reached easily and quickly.

These several improvements in the manner of travelling and carrying freight have exerted an immense influence upon the rapidity with which the Mississippi Valley has been settled. While 150 years had been consumed in pushing the settlements westward to Ohio and Kentucky, it required less than one-quarter of that time to extend them twice that distance farther west. Now, in spite of the great cities along the Atlantic coast, more people are living west of Cincinnati than east of it (Fig. 323), and the greater part of these are in the Mississippi Valley. Altogether, including the Southern States, that valley now supports a population of about 30,000,000. Large numbers of the settlers have come from Europe, especially from Germany, Scandinavia, and Ireland.

Agriculture

Millions of persons in Europe and in our coast cities look to this valley for their bread, meat, and other food, as they look to the South for cotton.

A Farm in Central Ohio. — All the way from eastern Ohio to central Nebraska, agriculture is a very important industry. The farms vary greatly in size, from a few acres to several thousand, but they usually contain from 80 to 160 acres. In the main, they resemble the one in Ohio that is described below.

FIG. 180.

Scenes on a farm in Ohio. Tell what you see in each picture.

This Ohio farm of 160 acres has a house upon it in which the family lives, with a barn near by for horses, milch cows, and hay, and with a few sheds around it for grain and farming implements.

A windmill in the rear keeps the milk house well supplied with cold water, and also fills the water troughs in the barnyard. On one side is an orchard having apple, peach, and pear trees, with a few rows of berry bushes in one part, and a chicken house in another, where enough chickens are raised to supply some meat, and all the eggs that are needed, with perhaps some to sell. On one side of the front yard are a few beehives, and back of them, between the orchard and the barn, is a garden for vegetables. Still back of that are several pig-pens, in which hogs are fattened for home use and also for the market.

Farther away from the house are fields in which there are at least three or four different kinds of crops. Every farmer in that vicinity expects to grow corn, perhaps sixty acres of it, some grass for grazing and for hay, and wheat or some other kind of grain. After these crops are harvested, they are either sold, or fed to stock — horses, cattle, hogs, or sheep — upon the farm. The latter plan is often followed, chiefly because it pays better to fatten stock and sell it than to sell the crops themselves. There are generally two or three good milch cows on hand, which not only supply the family with fresh milk and butter, but furnish some cream or butter to sell.

Since there are only three other houses in sight of this farmhouse, and there is no store or post-office nearer than two and a half miles, the farmer and his family may not be able to visit with other persons for several days at a time, although they often see acquaintances driving by.

In the busier season, from spring till fall, they make few trips to town, and then mainly for groceries or mail, or to church on Sunday; but at other times of the year they have leisure for reading, visiting, and other pleasures.

Some persons would not care for such a life because it is too lonesome, and there is too much hard work connected with it. But this farmer enjoys it greatly, because he likes to take care of his stock, to work in the soil, and to watch the crops grow. In addition to this, he is able to raise most of his own food, and his whole life is more inde-

FIG. 181.
Threshing wheat on a farm in Ohio.

pendent than that of persons in a village or city. From such farms have come some of our ablest and best-educated men. Can you name two Presidents who spent their childhood on farms of the Central States? Where were their homes? What can you tell about their early life?

Fruits. — While each farm usually has a small orchard, like the one mentioned above, fruit raising is a special industry in those parts where climate and soil are favorable, as in the neighborhood of the Great Lakes. The immense area of water renders the summers cooler and the winters warmer than they would otherwise be. Accordingly, we find the Chautauqua grape belt (p. 167) extending from New York a long distance

FIG. 182.

A fruit orchard in Kansas.

into Ohio; and quantities of such fruit as peaches and apples are produced on the peninsula of Michigan. With what part of the Atlantic coast can this fruit region be best compared? (p. 167.)

Tobacco. — Tobacco is another product of importance in these states (Fig. 333). We have seen that its cultivation was one of the industries in Virginia, North Carolina, and Tennessee (pp. 166 and 209). West of these states there are also sections, in both Kentucky and Missouri, where the soil and climate are favorable to tobacco raising. Both LOUISVILLE and ST. LOUIS are important tobacco markets. What other cities have the same industry? (pp. 166 and 209.)

Fine Stock in Kentucky. — Kentucky is famous for its blue grass in the neighborhood of LEXINGTON, and for its fine stock, especially horses and mules. The reason why this grass is so nourishing is that much of the Kentucky soil is composed of bits of decayed limestone in which is found an abundance of lime phosphate, an excellent plant food (p. 219). This phosphate is supplied from the shells of small sea animals which were buried in the sea bottom millions of years ago. As the limestone decays, the phosphate mixes with other rock bits and thus fertilizes the soil.

Caverns. — The abundance of limestone in Kentucky is the reason for the numerous caves that exist there. Limestone, although hard, is more easily dissolved by water than other

rocks; and as the rain water seeps into the earth and enters the limestone along the joints, it slowly dissolves the rock away. In this manner many a long tunnel has been made, the largest that is known being the Mammoth Cave in Kentucky.

Not all parts of Mammoth Cave are yet known, but it is said that there are more than 150 miles of galleries. They are found to wind about irregularly, some being many feet below others, and all together forming a network, or *labyrinth*, into which one dares not venture without a guide. The entire cavern is as dark as any mine, and the only sound to be heard is that of trickling water.

FIG. 183.

A view in one of the Kentucky caverns, showing the icicle-like stalactites, which are made of limey matter deposited by the water which slowly trickles from the cave roof.

Corn. — Corn raising is one of the most important industries of the Central States (Fig. 324, p. 406). A farmer usually expects to devote from one-third to one-half of his land to it; therefore, in travelling across these states in summer, one sees corn-fields in every direction (Fig. 184).

The seed is planted in rows in the spring time. Soon the little stalk appears above ground, growing rapidly during the hot summer months, until a height of from seven to ten feet is reached. In order to keep the soil soft and kill the weeds, the ground between the rows is ploughed when the corn is young; but as it grows higher, the shade of its own leaves protects it both from drought and weeds.

A field usually presents the most beautiful appearance in July, when the corn "tassels out." The leaves then entirely

FIG. 184.

A field in Kansas entirely given over to corn.

hide the ground from view for hundreds of acres, and the rich green stalks, with their long, slender leaves, bend to the breezes in the most graceful manner. If the stalk is to be used as fodder for cattle in winter, it is cut before frost, when the kernels on the cob are still somewhat soft and milky, although much harder than the green corn which we eat. If left until after frost, the grain hardens, and then the harvest season begins. Men drive into the fields in wagons, and tear the husks from the ear, spending day after day at that kind of work.

FIG. 185.

Two ears of corn, one with the husk stripped down to show the kernels.

Corn is put to many uses. Much that is

raised is fed to cattle and hogs, as already stated. Some is made into hominy and breakfast foods, or into corn meal for mush and corn bread. Starch is another product; but one of the most extensive uses of the grain is in the manufacture of whiskey in a *distillery*. There are many distilleries in St. Louis, Louisville, and other cities within the corn belt. Peoria, in central Illinois, is another great centre for the manufacture of whiskey and other materials from corn. Much corn is shipped eastward to the seaboard and beyond, and all the cities along the way make profit from handling it.

Wheat. — This grain, like corn, is produced in all the Central States as well as in other parts of the country (Fig. 326, p. 407). It is an especially important product in Ohio and Indiana; but the section which at present is most noted for wheat is the valley of the Red River of the North. In this valley is a strip of land, including western Minnesota, eastern Dakota, and a portion of Manitoba, which is one of the finest wheat regions in the world.

One of the reasons for its fertility dates back to the time when the glacier was melting away from this region. The ice then stretched across the Red River valley, and forced that river to seek an outlet southward. A broad lake was thus formed, with an ice dam on the north, and in the water of this lake the sediment was deposited which forms much of the soil of the wheat region. When the ice melted entirely away from the valley, the Red River was once more able to flow northward, and then the lake disappeared.

The land there is almost as level as the surface of the sea (Fig. 186); it is so level, in fact, that after a rain the water stands in shallow sheets in the fields. Also the roads need to be elevated a foot or more above the sur-

rounding land, with ditches on either side. It is a dismal place in which to live, for in every direction there is nothing to break the view except a farmhouse every half mile or so, with a few trees around it. Over these open plains the wind sweeps with terrific force, somewhat as upon the ocean, and fierce, blinding snow squalls, or *blizzards*, are not uncommon.

Upon these plains one may ride northward on the train toward Winnepeg all day long, and see scarcely a single crop besides wheat. Most of the farms are of moderate size, but some are enormous For example, the Dalrymple farm, at Casselton, North Dakota, contains fifteen thousand acres. How many square miles is that?

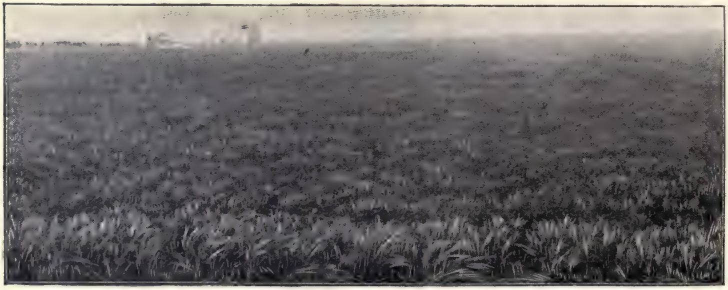


FIG. 186.

A view over the broad wheat fields of the Dalrymple farm. A grain elevator, belonging to the farm, is seen in the distance where the Northern Pacific Railway runs.

This farm is divided into six parts, with farm buildings upon each. To prepare the ground, from fifteen to twenty men at a time plough and sow the seed on each division. One takes the lead, the next follows close behind, then comes the third, fourth, and so on. The grain is harvested on a similar plan (Fig. 187). One hundred and twenty men and three hundred horses are employed in the planting season, and three

hundred men during the harvest. As one acre usually produces from fifteen to twenty bushels, an immense amount of grain is obtained from this one farm.

The great quantity of wheat produced in the Red River valley of the North and the neighboring region has helped in the growth of the cities of MINNEAPOLIS, ST. PAUL, and DULUTH. It has also influenced the growth

FIG. 187.
Harvesting wheat in the Red River valley.

of scores of other cities along the Great Lakes, the Mississippi River, and even on the Atlantic coast. Some of the largest of these are ST. LOUIS, MILWAUKEE, CHICAGO, NEW YORK, and BALTIMORE. Explain how this can be.

Other Grains. — Besides corn and wheat, two other grains are raised in great quantities in these states, namely, oats (Fig. 188) and barley. The former is a common food for horses, but the latter is largely used in the manufacture of beer. The great breweries, to be seen in every large city, consume immense quantities of barley in order to obtain the *malt* which is needed in making beer. In CINCINNATI and ST. LOUIS, and in many other places, beer making is one of the important industries. MILWAUKEE is also noted for beer, much as PEORIA is for distilled spirits.

FIG. 188.
A field of oats almost ready to harvest.

Cattle Ranching. — After passing westward from the fertile Red River valley of the North, one finds the farmhouses diminishing in number, and the country becoming more and more arid, until, beyond the 100th meridian, there is no farming without irrigation. At the same time one gradually rises higher and higher, until, near the base of the mountains, he has reached an elevation of fully a mile above the sea. This dry plateau, extending from Canada to southwestern Texas (p. 205), is commonly known as the *Great Plains.*

At one time farmers, believing that the rainfall was increasing, settled in the eastern portion of these dry plains, especially in the extreme western part of Kansas. They succeeded well at first. But disastrous droughts soon followed, and the number of abandoned farms and almost deserted towns is proof that this region, where the rainfall is less than twenty inches a year (Fig. 46), is not suited to farming.

The entire semi-arid western third of the western tier of states — from Texas to North Dakota — is therefore

FIG. 189.

Scenes in the ranch country. Upper picture, a typical ranch house on the banks of a stream in western North Dakota. Middle picture, a ranch house and "the range." Lower picture, a group of cowboys at the ranch house.

devoted chiefly to ranching. Following is a description of ranch life in western North Dakota, which much resembles such life in other states: —

There is little water anywhere else than in the widely separated streams; and there are almost no trees except upon their banks. As the ranchman must have both water and timber, he locates his house (Fig. 189), with its few stockades or *corrals*, and sheds, within easy reach of these necessities. If there is no neighbor within several miles, it is all the better, for his cattle are then more certain of abundant grass.

Fig. 190.

A scene during a round-up, when great numbers of cattle are bunched together.

Few fences are built, partly because it is necessary for the cattle to roam about at will in their search for food. The bunch grass, upon which they feed, is so scattered that they must walk a long distance each day to find enough to eat. A single ranchman may own from ten to twenty thousand head, and yet they are all allowed to wander about upon public land, called "the range." Usually they keep within a distance of thirty miles of the ranch house; but sometimes they stray one or two hundred miles away.

Twice a year there is a general collection, or *round-up* (Fig. 190), of cattle, — the first round-up occurring in May or June, and the other early in the fall. One object of the first is to find the calves that have been born during the winter.

Since there are few fences, cattle belonging to ranches which are even a hundred miles apart become mixed during the winter, and those in a large herd may belong to a score of different ranchmen. Each cattleman has a certain mark, or *brand* (Fig. 191), such as a letter, a cross, a horseshoe, or some other device, which must be burnt into the side of every cow; and that is the sole mark of ownership.

Fig. 191.

Picture showing the mother with her brand, a calf following her, and a cowboy about to catch the calf and brand it.

A round-up, which lasts several weeks, is planned by a number of ranchmen together. A squad of perhaps twenty cowboys, accompanied by a wagon and provisions, a large number of riding horses, or "ponies," and a cook, go in one direction, and other wagons with similar outfits set out in other directions. Before separating in the morning, the members of a squad agree upon a certain camping place for the night, and then they scour the country to bring the cattle together, riding perhaps sixty or eighty miles during the day. Each ranchman knows his own cattle by the brand they bear; and since the calves follow their mothers, there is no difficulty in determining what brand they shall receive. After branding the calves, each ranchman drives his cattle homeward to feed during the summer within a few dozen miles of their owner's home.

The second large round-up is similar to the first, except that its object is to bring together the *steers*, or male cattle, and ship them away to market; it is accordingly called the *beef round-up*. A ranchman who owns twenty thousand cattle may sell nearly half that number in a season. As the steers are collected they are loaded upon trains and shipped to Omaha, Kansas City, St. Louis, Chicago, and even farther east.

Millions of cattle are slaughtered every year in these cities (Fig. 202), and the meat is sent to England and Germany, as well as to all parts of the United States.

Very often the cattle find so little water, and such poor pasturage, that they fail to fatten properly, and must be fed for a time. This may be done upon the irrigated fields near the rivers in the ranch country, or on the farms farther east, as in Kansas, Iowa, and Nebraska, and even in Illinois, Indiana, and Ohio. Thus we see how a great product of one section of the United States is made to furnish employment and food for millions of persons far away.

Fig. 192.

A cowboy with his rope, or *lariat*, with which he captures the steers by throwing a noose over their necks, or around their legs.

The lives of ranchmen and cowboys are exciting and interesting, most of each day being spent in the saddle (Fig. 192). They are so far separated from other people that they must take care of themselves in a surprising number of ways. For instance, a ranchman must build his own house, kill his own beef and dress it, put up his own ice, raise his own vegetables, do his own blacksmithing, find his own fuel, and even keep school for his children, if the latter receive an education. He affords a good example of the pioneer life in early days.

Lumbering. — Although so much of the land is under cultivation, or given over to ranching, forests are found in many sections. When the region was first visited, most of Minnesota, Wisconsin, and Michigan was tree-covered, as well as much of Ohio, southern Indiana, and Illinois,

and the Black Hills of western Dakota. Even now some forest is left, although there has been so much lumbering that large areas have been entirely cleared.

In Wisconsin, for instance, in travelling northward from the well-cultivated southern portion, one comes to a section where farmers are just taking the place of lumbermen. Many log huts stand there in small clearings, with the green fields still dotted by tree stumps; but beyond, little else than woods can be seen. In these forests are many different kinds of Northern trees, especially

FIG. 193.
Floating timber on a stream in Wisconsin.

the evergreens, such as hemlock, spruce, white pine, and cedar, and scattered hard woods, such as oak, birch, and maple.

In the neighborhood of the Great Lakes lumbering is actively carried on, and in much the same manner as in Maine (Fig. 193), although a great deal of the timber is brought to the sawmills by wagons or rail, instead of being floated a long distance down stream. The excellent water power in the Mississippi River at MINNEAPOLIS early attracted large sawmills there and made that city famous for lumber (Fig. 207, p. 272). Other mills are situated

farther down the Mississippi, as at WINONA. They are also numerous at DULUTH, and at SUPERIOR just across the state line in Wisconsin.

Near the forest regions, along the streams and on the shores of the Great Lakes, the manufacture of furniture and other articles of wood is an important industry. CHICAGO is especially noted for its manufacture of furniture; and on many of the small streams of Minnesota, Wisconsin (Fig. 194), and Michigan, where there is water power,

FIG. 194.
A sawmill in Wisconsin.

there are sawmills, furniture factories, and planing-mills. Some of these are at LA CROSSE and OSHKOSH in Wisconsin, and SAGINAW, BAY CITY, and GRAND RAPIDS in Michigan. Many school desks are made at the last place.

MINERAL PRODUCTS

Building Stone. — It has been stated (pp. 2 and 10) that the ocean once covered much of this section, and that layers of sediment deposited under the water have hardened into rock

strata, which have been raised to form the dry land. During their uplifting they were not folded and broken, as mountain rocks are, but the layers were left in a horizontal position, as when first laid down in the ocean. The streams, cutting their valleys downward through the soil, have brought many of these rock strata to light, and among them are beds of limestone and sandstone which are of value as building stones.

Ohio and Indiana are especially noted for their limestone and sandstone, which are shipped in all directions for building purposes. There are also slates and granites in the hilly and mountainous sections, as there are in hilly and mountainous New England (p. 133).

Petroleum and Natural Gas. — Power for manufacturing is also abundantly provided in this region. When oil and natural gas were first discovered in New York and Pennsylvania, it was supposed that they did not exist elsewhere; but great quantities of both these substances are now obtained in Ohio, Indiana, West Virginia and other states. Many farmers, whose land is capable of producing only the usual crops, have suddenly found themselves rich by the discovery of oil or gas in the rocks far beneath the soil. In fact, these materials are so abundant in some places, that towns have sprung up like mushrooms, — as FINDLAY in western Ohio. The way in which gas and oil are formed, and the uses to which they are put, have already been described (p. 173).

Coal. — This mineral fuel is much more widespread in the Central States than oil and gas. In some places the beds lie near the surface, like rock in quarries, and then coal mining is very simple ; in others it is buried so deep that long shafts must be sunk to reach it. Being so valuable a fuel for houses and manufactories, the coal is mined in many places.

While Pennsylvania produces two kinds of coal, anthracite and bituminous, the Central States have only the latter variety. It is bituminous coal that is used in making coke; and because there is so much of this kind of coal, many of the cities of these states are engaged in iron manufacturing. Soft coal produces more smoke than the hard anthracite, and those cities which burn great quantities of it are very sooty in consequence.

Iron Ore. — Formerly Pennsylvania was the chief iron-producing state, having both coal and iron ore; but in recent years, explorers in the forest wilderness northwest of Lake Michigan, and near the western end of Lake Superior, have discovered what seem to be inexhaustible beds of iron ore.

FIG. 195.
An open iron mine in the Lake Superior district.

In some places the ore is so soft that, like clay, it can be dug out by steam shovels, and so near the surface that the mines are open pits (Fig. 195). That is the case, for example, at ISHPEMING, in northern Michigan.

This Lake Superior district is now the leading iron-producing centre in the world. The main difficulty, however, is the fact that there is no coal in that region. Consequently, in order that the ore may be reduced to the metal, either coal must be transported thither or the ore must be carried to the coal regions. The latter process has proved the cheaper.

Fortunately the ore deposits are located near waterways. If it were necessary to carry the iron ore a long distance by rail, the expense might be so great as seriously to check its production. As it is, however, the ore is mined, loaded upon cars, and sent over short lines of railway to the lake shore. Great ore docks (Fig. 197), or piers, reaching far out into deep water, have been constructed to hold the ore. Railway tracks are built upon the docks, and whole trains run out and speedily dump their contents into bins. On a single pier there are scores of bins, which together hold enough ore to fill several large vessels. When a vessel is to be loaded, it is moored to the pier (Fig. 198), and a door at the bottom of a bin is opened, allowing hundreds of tons of ore to slide out; then the next bin is emptied, and in this way the vessel is filled in a few hours.

Fig. 196.

Tunnels in one of the deeper iron mines in the Lake Superior district.

Fig. 197.

Iron ore piers at Ashland, Wis.

Boats with such a cargo set out from the lake ports of Duluth, Superior, Ashland, and Marquette for manu-

facturing centres all along the lakes. As the ore must reach a point where coal is easily obtained, it is taken to CHICAGO, DETROIT, CLEVELAND, BUFFALO, etc. Notice how close to these cities the coal beds extend (Fig. 337).

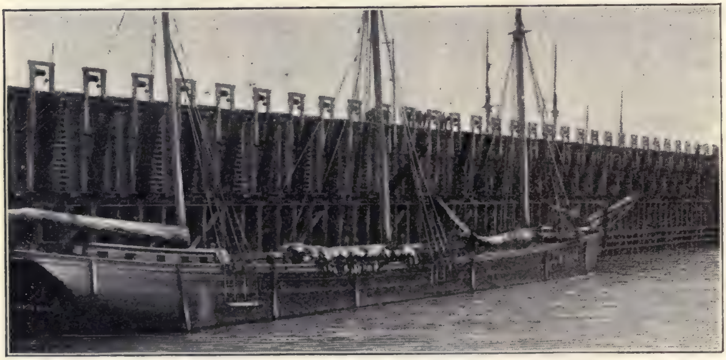


FIG. 198.

A lake boat loading with iron ore at the docks (Fig. 197).

The Lake Superior iron district is in three states,— Michigan, Wisconsin and Minnesota, the most important being Michigan (Fig. 339), and the least important Wisconsin. These three states together produce seventeen times as much ore as Pennsylvania. The sudden development of mining in this region has brought so many people that numerous towns and cities have grown up; but the lack of coal has prevented much iron manufacturing.

Copper. — Another very important metal found in the Central States is copper. This occurs in the pores of a lava rock and between the grains of a pebble beach which, though now hardened into rock, was formed in the ancient sea. Indians and the early explorers found fragments of copper on the surface, and mines were later opened in

the lava and beach rocks of the small peninsula marked Mineral Range on the map (Fig. 178).

Some of these mines are very deep, one of the shafts reaching to a depth of about a mile. When the ore is drawn to the surface, it is found mixed with so much beach rock and lava, that it must be crushed to a powder under powerful hammers, or *stamps;* then water is run over it in order to carry away the bits of rock and leave the heavier particles of copper. Even after this, some foreign substances are still mixed with the copper. Since the purposes for which this metal is used demand that it be very pure, it must next be placed in a large *smelter* to be melted and thus separated from the impurities. Among the latter is a little silver, which is saved. The pure copper is then run out and cooled in bars to be shipped away.

The largest mines in this region are near together, and so many men are required to obtain the ore, and change it to pure metal, that towns of large size have grown up in a wilderness which otherwise could scarcely have attracted many people. Within a few miles of two or three of the most important mines are a number of towns having a total population of fifty thousand, the largest being CALUMET. Many of these persons are miners and families of miners; but there must, of course, be storekeepers, physicians, teachers, ministers, etc., and they all depend for a living upon the precious copper buried far beneath the surface.

Copper is valuable in many ways. It is one of the metals which form bronze, and also brass; but of late years the wide introduction of electricity has created a new and even greater demand for this metal. Since copper is a substance which allows electricity to pass through it more easily than other common metals, it is the best material for trolley wires, the wire of long distance telephones, electric bells in houses, etc. In every city in the land much copper is used.

As in the case of iron ore, the metal is shipped to points along the lakes, and elsewhere, by water and by rail, much of it going to the metal manufactories in the New England cities (p. 147). Name some goods that must be shipped *into* this section instead of away from it.

Lead, Zinc, etc. — Lead and zinc, two other metals found in the Central States, occur together in pockets and little veins, in layers of limestone. The ores are mined in many places, as at JOPLIN, Missouri, and then sent to the proper kind of furnaces where the pure metals are extracted.

A large part of our supply of lead and zinc is obtained from Missouri, Kansas, Wisconsin, and Iowa, the first-named state producing more zinc than any other in the Union. For what purposes are lead and zinc used? Of what use should you think this lead was to the early pioneers?

Besides these metals, gold is mined in considerable quantities in the Black Hills in the extreme western part of Dakota.

Much salt is also obtained in the Central States, especially in Michigan and Kansas.

Clays. — The deep soil left in the prairie states by the glacier is often a clay which is useful in the manufacture of bricks; and, as in other sections of the country (p. 180), there are many brickyards, especially near the large cities. From this same kind of clay, other articles, such as flower-pots and drain-pipes, are manufactured. During recent years, when drainage of farm land has become so common, the manufacture of tile for that purpose has developed into a great industry, many a small town having a tile factory. These objects are made in much the same manner as brick (p. 180), except that the clay is pressed into other forms.

There are a number of places where fine pottery also is made. For instance, a very high grade, known as Rookwood ware, is manufactured in CINCINNATI. The best of clay is needed for this, and some of it must be brought from a distance. The first step in making a vase is to wet a lump of clay so

that it may easily be moulded, and then shape it upon a rapidly revolving wheel, known as the potter's wheel (Fig. 139), which has been in use for centuries. There it is whirled rapidly round while a man moulds it with his hands, in a very few minutes changing a shapeless lump into a delicately formed vase. It must then be baked. After the baking, flowers or other ornaments may be painted upon it. The surface is finally covered with a substance which, when baked, produces a *glaze*. One of the beauties of the Rookwood ware is the peculiar color of the glaze, which is a dark brown or yellowish brown.

Principal Cities and Shipping Routes

It is evident that the raw products of the farms, ranches, forests, and mines in the Central States must lead to much commerce; and that, since coal is included among the raw products, manufacturing must also be developed. This means, of course, that there must be many large cities; and since the Central States have no ocean coast, we naturally find them along the Great Lakes and the three great rivers, — the Mississippi, Ohio, and Missouri, — where it is possible to ship goods by water. Let us first consider those along the Great Lakes.

THE LAKE CITIES

Duluth and Superior. — At the western end of Lake Superior there is a fine, large harbor, one side being in Minnesota the other in Wisconsin. Upon this harbor are two cities, Duluth and Superior, which together have a population of little less than one hundred thousand. The chief products of this vicinity are iron, lumber, and wheat, which are shipped eastward in immense quantities from these two ports. Owing to the neighborhood of the

Minnesota and Dakota wheat fields, there are enormous elevators (Fig. 201) at Duluth for storing grain, and flour-mills for grinding it up. The iron ore docks, saw-mills, and lumber wharves are also busy places.

Goods are shipped *to* this point as well as away from it; for while the people in this section have some materials to spare, they also need many others, as farming implements, clothing, various kinds of food, furniture, and coal. These goods are brought cheaply, because the vessels carrying ore, wheat, and lumber eastward must have something to bring

Fig. 199.

Lake vessels, the one in front being called a whaleback.

back. As already suggested (p. 181), it is the needs and products of the inhabitants of this distant region which help to make Buffalo, Montreal, and New York so important, and to keep the mills and factories of New England so busy. Explain how this is true.

At the outlet of Lake Superior into Lake Huron, there are rapids which interfere with navigation; and to avoid these a ship canal, called the Sault Ste. Marie, or "Soo," canal, has been dug. On its banks is a city of the same name.

Chicago. — While Lake Superior extends far into the Central States in one direction, Lake Michigan reaches a

long way in another; and near its southern extremity, in Illinois, the great city of CHICAGO is located. At this point the small Chicago River empties into the lake (Fig. 200), forming a small harbor, and in early times a fort was located there. The harbor itself was formed thousands of years ago while the great glacier was melting away. At that time, the ice sheet lay across Lake Michigan, forming a great dam which prevented the waters from flowing into Lake Huron and the St. Lawrence River. This compelled the water to find an outlet southward, past the present site of Chicago, and into the Illinois River and the Mississippi. It was the wash of this water which dug out the small harbor.

As the West developed, this site proved to be a most advantageous one ; for whenever a railway was built from the East to the Northwest, from any place north of Washington, it was necessary for it to pass around the southern end of Lake Michigan. Of course, as the city grew in size, other railways were built to it *because* it was large ; and now they approach it from the East, West, North, and South (Fig. 200).

Chicago is the nearest lake port to the most productive grain region in the world, and it is therefore an important shipping point for grain. It is also within easy reach of the coal fields, while lumber and iron ore are readily brought to it by boat. These facts have caused Chicago to grow with wonderful rapidity, so that it has long since outgrown its small natural harbor, which has been enlarged by extensive breakwaters (Fig. 200). In the year 1840, there were but 4,470 inhabitants ; in 1870, 300,000, and now 1,698,575. To-day Chicago is the second city in size in the New World.

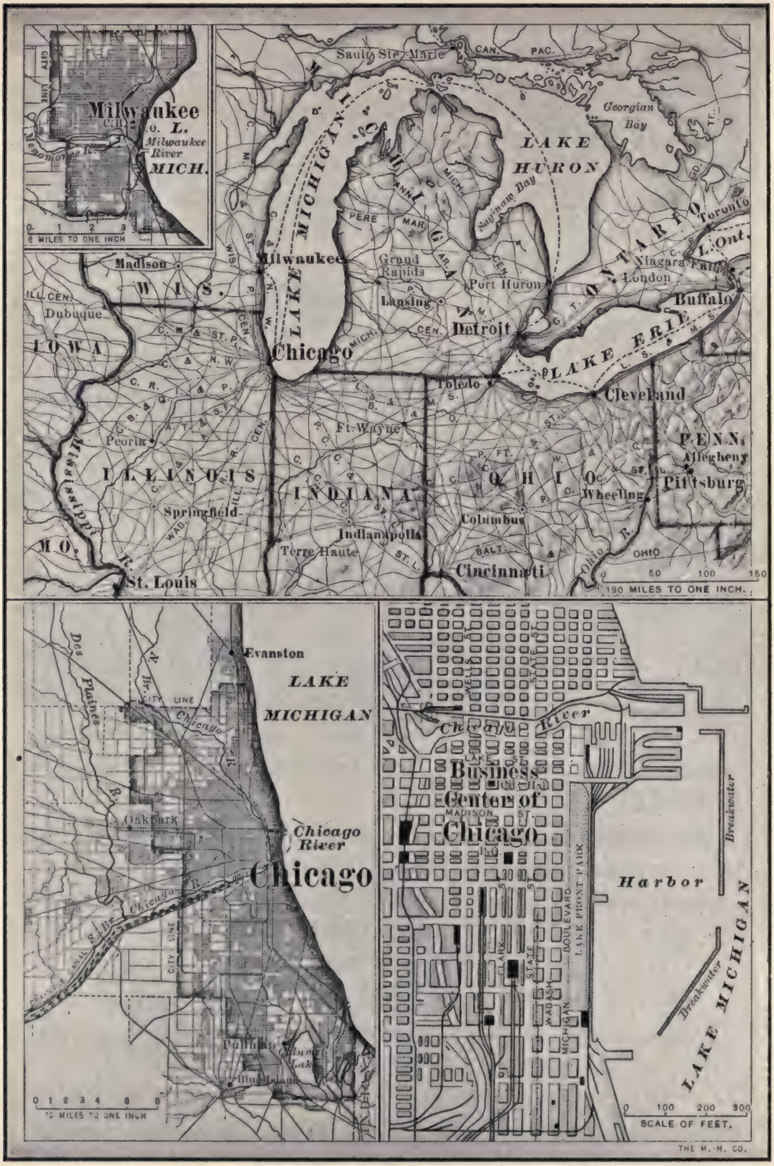


FIG. 200.

Map showing the location of Chicago and Milwaukee.

Elevators. — Elevators are more numerous in Chicago than in Duluth. They are built for the purposes of transferring grain, as from cars to boats, for storing it, mixing different qualities together, cleaning it from rust and seeds, and airing it so that it will not spoil.

For these objects the buildings are located at the very water's edge, if possible, and close to a railway. They are called *elevators* because the grain they receive is *elevated* to the top of the lofty building, to be dropped from there into deep bins. The main part of the structure is occupied with rows of bins, usually from five to eleven feet square and perhaps a hundred feet deep. There may be as many as five hundred bins in a single large elevator. Above these is located some of the machinery for drawing up the grain and distributing it; and since a small space answers for the latter purpose, the topmost part of the building is often narrower than the rest, as in Figure 201.

FIG. 201.

A huge grain elevator near the waterside.

Since many boat loads of grain are stored in a single elevator, it must be an exceedingly strong building. One may cost as much as a million dollars, yet there are more than thirty in Chicago, and a large number in Duluth, Minneapolis, Cleveland, Buffalo, New York, and other cities.

Stock Yards of Chicago. — Chicago is not only a great grain market, but also the most important meat market in the world. All the grazing states of the West ship

stock to this point, and in the city itself nearly a square mile is taken up by the Union Stock Yards, consisting of large sheds, pens with high fences, and troughs for food and water (Fig. 202). Train loads of cattle, hogs, and sheep are unloaded there every day. The work employs about thirty thousand men, which indicates how extensive it is.

The products of the packing houses are several. By far the most important is meat; and so well developed is the industry that most of the cities of the East are furnished with fresh meat from the Western cities. It may be several weeks after the meat is prepared for food before it reaches the table; yet all this time it is kept fresh by the use of ice. Special refrigerator cars are constructed for the purpose of carrying it.

Fig. 202.
The Chicago stock yards.

Besides what is sold fresh, a great deal is canned. The fat of the hog is made into lard, and not a little beef fat is converted into imitation butter, such as oleomargarine. From the bones, also, valuable products are obtained. Many of the bones are burned and used in the manufacture of sugar (p. 215); and the horns and hoofs are of use in making gelatine and glue.

The hides are made into shoes, gloves, harness and

other leather goods. From the western packing houses the great shoe factories of Lynn, Haverhill, and Brockton, in Massachusetts, as well as those in other parts of the country, are supplied with a large part of their leather. The hides, however, must first be sent to tanneries, one of the principal places being MILWAUKEE, which is supplied with tannic acid from the bark of the hemlock tree which grows in the forests of Wisconsin. Nothing is wasted in the packing business; even the bristles of the hog are saved to make brushes; and the hair removed from the hides of cattle is valuable in making plaster.

Manufacturing in Chicago. — Being near the forest regions, Chicago has become a lumber market; and iron ore is also easily brought by boat. Therefore, the opportunities for manufacturing are excellent; for, although there is no natural water power in that vicinity, vast coal fields are not far away.

The Illinois Steel Company alone employs ten thousand men, making iron and steel goods of many kinds. An enormous amount of furniture is manufactured for all parts of the West, and farming implements as well. Each year the McCormick Harvesting Machine Company sends out about three hundred thousand machines. The Pullman Car Works manufacture more than ten thousand freight cars, besides several hundred Pullman and passenger cars. The manufacture of clothing, as in New York (p. 187), is also an immense industry.

Other Facts about Chicago. — The sewage from the city has heretofore been emptied into Lake Michigan; but as the drinking water must be taken from the lake, it became necessary to dispose of the sewage in some other way. For that purpose an immense drainage canal has recently been completed (Fig. 200), connecting Lake Michigan with the Illinois River, and

thus setting the current toward the Mississippi and the Gulf of Mexico. This drainage canal, which is wide and deep enough for vessels, will undoubtedly develop into a ship canal. In that case, large boats may reach Chicago from the Gulf of Mexico, as they now do from the Gulf of St. Lawrence. What effect would this have upon the city?

The chief educational institution is the University of Chicago, which, although established so recently as 1890, has almost as many students as the older universities of the East. Mention some of the larger eastern universities.

Other Cities along the Lakes. — Other great cities along the lakes are engaged in many of the same industries as Chicago, and need not be so fully described. MILWAUKEE (Fig. 200), the largest in Wisconsin, deals extensively in grain, lumber, and leather, packs much pork, and manufactures a great quantity of flour and machinery. Its immense breweries have already been mentioned (p. 247).

DETROIT (Fig. 209), the largest city in Michigan, is also on the Great Lakes water route. The name is a French word for strait. Why suitable here? All vessels going east or west must pass this city; and railway trains from eastern Canada to Chicago and the West are ferried across the strait at this narrow point. Detroit is consequently a shipping and manufacturing centre, dealing in grain, wool, pork, and ores from the West, and making iron and steel goods, such as cars, stoves, etc.

Not far away, at ANN ARBOR, is the University of Michigan, one of the largest educational institutions in the United States. It is supported by the state; in fact, state universities are established in most of the Central, Southern, and Western States.

On the lake shore in Ohio the chief cities are TOLEDO and CLEVELAND (Fig. 209). The former has extensive

flour-mills and iron manufactories; and the latter, which is much the larger, and even larger than Cincinnati, Detroit, and Buffalo, has an important trade in grain, lumber, and ore. Being near the coal and petroleum fields, Cleveland is extensively engaged in manufacturing machinery and furniture, in refining petroleum, and in shipbuilding for the lake commerce. It is one of the busiest and most rapidly growing of the lake cities.

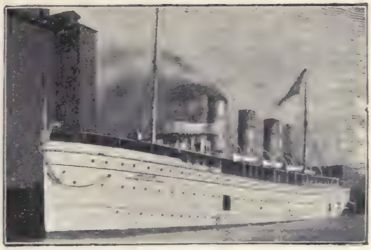


Fig. 203.
A lake steamer at Chicago.

THE RIVER CITIES

Cities along the Mississippi. — The largest city on the rivers, corresponding to Chicago on the lakes, is St. Louis in Missouri (Fig. 204). It has a very favorable position in the centre of the productive Mississippi Valley. This, together with the fact that it is situated on the Mississippi River near the mouth of its two largest tributaries, secures for it a large amount of trade both by water and by rail. The location of railway bridges across the broad Mississippi at this point has also had an immense influence on the growth of the city.

Like Chicago, St. Louis is an important market for grain and live stock; but being so far south, it trades also in Southern products, especially cotton and tobacco. This city is also a noted mule and horse market, and a great manufacturing centre. It manufactures immense quantities of tobacco, beer, flour, boots, shoes, clothing, and hardware.

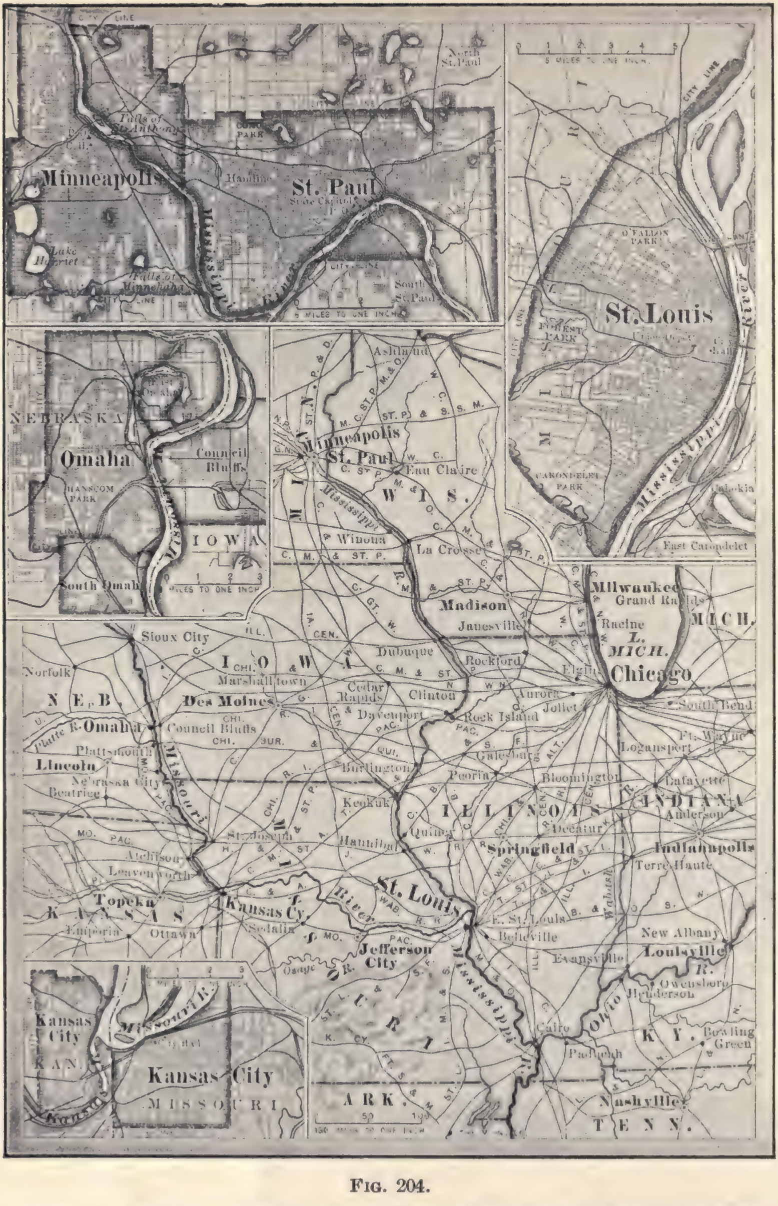


Fig. 204.

Map showing the location of St. Louis, Kansas City, Omaha, Minneapolis, and St. Paul.

Formerly Chicago and St. Louis were almost the only noted markets for grain and live stock in the West; but in later years several other cities have become prominent in that section. Two of these are the "twin cities," MINNEAPOLIS and ST. PAUL (Fig. 204). The latter, the capital of Minnesota, is a trade centre. From it the products of the West are sent eastward and southward, while farming implements, furniture, clothing, and other articles are distributed among the smaller towns of the vast farming region round about.

FIG. 205.
Railways approaching St. Paul.

MINNEAPOLIS, only ten miles distant, is located at the Falls of St. Anthony, which furnish splendid water power. It is also in the midst of the wheat region; and this, together with its water power, has caused Minneapolis to become the leading flour-producing centre in America. In the city are many grain elevators and flour-mills (Fig. 206).

One of these flour-mills, belonging to the Pillsbury-Washburn Company, is the largest in the world. Steam shovels scoop the grain from the trains very rapidly, emptying a car of 750 bushels in eighteen to nineteen minutes. All straw, useless seeds, sticks, etc., must first be separated from the grain, and then it passes through many different machines before the pure flour is produced. During this process it must be raised to the top of the building twelve different times, being carried

up by rapidly moving belts having many small buckets, or pockets, attached.

Just inside the husk of a wheat grain is the kernel, the most valuable part of the wheat. First, the husk is removed by machinery, and this is sold for bran and shorts, while the centre, called the heart, or germ, is made into breakfast food. The other portion is ground into flour, poured into sacks and barrels by machinery, and then sent sliding down an inclined plane into the cars which stand near by. This one mill has ground as much as 61,000 barrels of flour in six days. The daily capacity of five mills owned by this company is 25,000 barrels. It would require 400 cars, or 20 trains of 20 cars each, to bring the grain needed each day, and to carry away the flour and other products.

FIG. 206.
The Pillsbury-Washburn flour-mills at Minneapolis.

FIG. 207.
Logs in the river near Minneapolis. One of the bridges across the Mississippi River at this point is seen in the background.

What have you already learned about the influence of the St. Anthony's Falls on the lumber industry of Minneapolis?

Other smaller cities on and near the Mississippi, between this point and St. Louis, are WINONA in Minnesota; LA CROSSE in Wisconsin; DUBUQUE, DAVENPORT, and DES MOINES in Iowa; and QUINCY and PEORIA in Illinois. Each is important either for lumber, grain, or farming implements, or for all three combined.

Cities along the Missouri. — The leading cities on the Missouri River are OMAHA in Nebraska and KANSAS

FIG. 208.

Hogs in eastern Kansas being fattened for the market.

CITY (Fig. 204) in western Missouri. Each is surrounded by a fertile farming country which produces much grain. Each is also a market for cattle, sheep, and horses raised near by and in the semi-arid region farther west. Being so near the ranching country, both of these cities have an advantage over St. Louis and Chicago, and their meat-packing industry is gaining rapidly each year.

Fig. 209.

Map showing the location of Detroit, Cleveland, Cincinnati, and Pittsburg.

Southwest of Omaha is LINCOLN, the capital of Nebraska; and across the river in Iowa is COUNCIL BLUFFS, an important centre for farming implements. Several cities northwest of this point are chiefly important as trade centres. Find some of them on the map. On the river above Kansas City is ST. JOSEPH in Missouri, and below it is JEFFERSON CITY, the capital of that state. Farther west, in Kansas, are WICHITA and TOPEKA, the capital. Since we know the products of this section, it is clear why most of the larger cities are centres for stock, grain, and flour.

Cities in the Ohio Valley. — In the Middle Atlantic States, three cities of the upper Ohio — Pittsburg, Allegheny and Wheeling — were found to owe their importance largely to coal and iron, and to the fact that river boats could reach them.

FIG. 210.
River boats on the Ohio at Cincinnati.

Farther down the river is CINCINNATI (Fig. 210), the largest city in the Ohio valley, and a great manufacturing center. Besides pottery (p. 260), this city manufactures large quantities of iron, machinery, and clothing. Across the river in Kentucky are COVINGTON and NEWPORT (Fig. 209), both almost a part of Cincinnati, as Jersey City is almost a part of New York. Farther north and east, in Ohio, are DAYTON and SPRINGFIELD, both noted for the manufacture of farm machinery. DAYTON, like Pullman

in Chicago, makes a large number of cars. COLUMBUS, the capital, is an important trade centre, and manufactures carriages, wagons, and other articles. The reasons why these cities are engaged in the manufacture of carriages and farm machinery are, first, the presence of the necessary raw materials, such as iron ore, coal, and hardwood; and, secondly, the many farms upon which these manufactured articles are needed.

Farther down the river is LOUISVILLE, the largest city in Kentucky. There are rapids in the Ohio at this point, and a canal leads around them. Besides being a centre for tobacco, like Richmond and St. Louis, Louisville manufactures iron goods, farming implements, flour, and leather goods. It is also a railway centre for lines reaching into the Southern States.

EVANSVILLE, the largest river port in Indiana, is principally engaged in the manufacture of flour, machinery, and leather goods. INDIANAPOLIS, the capital and metropolis of Indiana, is in the midst of a splendid farming district. It is a railway and trade centre like Columbus, and handles a large amount of grain, lumber, and furniture. What other large cities can you name that are not located upon important water routes?

QUESTIONS AND SUGGESTIONS

REVIEW QUESTIONS AND TOPICS. — (1) Describe the physiography: — the plains; the mountains; the prairies; the soil. (2) What about the climate of the section? (3) Tell about the settlement of the Mississippi Valley: — first pioneers; use of the rivers; steamboats; canals and railways; rapid settlement in later years; population. (4) Describe the farm in Ohio: — its size; the buildings; the products; life on the farm. Would you care to live there? Why? (5) What fruits are raised, and where? (6) Where is tobacco raised,

and what cities are engaged in its manufacture? (7) What kinds of stock are raised in Kentucky? What is the reason for their fine grade? (8) Describe the Mammoth Cave. (9) Tell about corn:— the planting; the care of the field; uses of corn; cities which handle the corn. (10) Where is wheat raised? (11) Describe the Red River valley of the North. (12) Tell about wheat raising on the Dalrymple farm. (13) What cities have been influenced by this wheat region? (14) What other grains are raised? For what are they used? In what cities? (15) Describe cattle ranching:—where carried on; reason; the cattle ranch; wandering of the cattle; object and nature of the spring round-up; of the beef round-up; what is done with the cattle; the life of the cowboys. (16) Where are the forests? (17) What kinds of trees are found? (18) How is the lumbering carried on? (19) What cities are engaged in lumbering? In the manufacture of articles from wood? (20) What is the origin of the building stones? What kinds are found? Where? (21) Where are oil and gas obtained? Of what use are they? (22) Where is coal found? To what uses put? (23) Tell about the iron mining:—its development; nature of the ore; where sent; reason; manner of loading the vessels; cities sent from and shipped to; states producing it. (24) Study about copper:—where found; how found; mining; obtaining the metal from the ore; towns near the mines; uses of copper. (25) What other minerals are obtained? Where? (26) What clay products are manufactured? (27) Where is Rookwood ware made? How? (28) Where are the principal cities to be looked for? Why? (29) What cities at the western end of Lake Superior? For what are they important? (30) Give the reasons for the location of Chicago and its wonderful growth. (31) Describe an elevator. (32) Describe meat packing in Chicago. (33) To what uses are the various products put? (34) What manufacturing is carried on in Chicago? Why? (35) State some other facts about Chicago. (36) Briefly enumerate the important facts about Chicago. (37) What other Great Lake cities are there? For what is each important? (38) Name the cities along the Mississippi River, and tell for what each is important. (39) Describe flour milling. (40) Name the cities along the Missouri. For what is each important? (41) Do the same for the Ohio valley.

Review by States: *Ohio* (*O.*).—(1) Name the four largest cities, (table, p. 448). Where is each located? Why there? (2) What other cities of Ohio are mentioned? For what is each important? (3) Why is there much manufacturing in this state? (4) What other industries are mentioned in the text? (5) Examine the maps

(Figs. 324 to 334) in order to see what crops are raised in Ohio. (6) In what ways are the cities of Ohio dependent upon New Orleans and New York? How are the latter cities dependent upon those in Ohio? (7) Of what service to Cleveland and Toledo is the Erie Canal? (8) Draw a sketch map of Ohio like that of Maine (p. 155). Do the same for each of the other states as you study about it.

Indiana (*Ind.*). — (9) Examine the maps (Figs. 324 to 334) to see what crops are produced in Indiana. (10) Which is the largest city? For what noted? (11) What other cities were mentioned? (12) What are the industries of Indiana? (13) Examine the relief map to see if the relief seems favorable to farming. What other Central States resemble this in relief? (14) Of what importance was the fact that so large a part of this section was treeless when discovered?

Kentucky (*Ky.*). — (15) Why should this state be better adapted to tobacco raising than Ohio? (16) Of what importance is the limestone of Kentucky? (17) Where are most of the cities located? Why there? (18) What products are mentioned from Kentucky? (19) Which is the largest city? For what important? (20) What other cities are mentioned?

Illinois (*Ill.*). — (21) What industries are mentioned from this state? (22) Examine the maps (Figs. 324 to 334) to see what crops are raised. (23) What reasons can you state why there is much manufacturing in Illinois? What kinds are carried on? (24) Of what value is the lake to manufacturing? (25) State the reasons why Chicago has developed so greatly. (26) What other cities are mentioned in this state? For what is each important? (27) In the table (p. 448) find the population of the three largest cities of each of the four states so far reviewed, and compare them. (28) Which of these four states is the largest? Which smallest? (Table, p. 445.) Compare each with Massachusetts and New York in size. In population (table, p. 445).

Michigan (*Mich.*). — (29) What lakes does this state border? Of what advantage is this? (30) What disadvantage can you see in the fact that water separates the lower from the upper peninsula of Michigan? (31) Ice stops lake traffic in winter. What effect must this have? (32) Into what waters does this state drain? Contrast this with the other states. (33) Where are most of the large cities? Why there? (34) For what is each important? (35) What reasons can you give for the location of Detroit? (36) What important products come from Michigan?

Wisconsin (*Wis.*). —(37) Which is the largest city in this state? For what important? (38) What other cities are mentioned in the

text? What is done in each? (39) Compare Wisconsin with Michigan in relief; in industries; in mineral products; in crops (see Figs. 324 to 334); in the size of cities. (40) What effect must the lakes have upon the climate? Would this influence be greater or less than in Michigan? Why? (41) If there were coal beds in northern Wisconsin, what effect might it have upon Chicago, Cleveland, and the coal mining of Pennsylvania?

Minnesota (Minn.). — (42) On Figure 64 find the summer temperature of northern Minnesota. On Figure 63 find the winter temperature. How much difference do you find? Compare that with the difference at Boston, New York, and San Francisco. (43) Where does the Mississippi River rise? (44) What ocean receives the waters that fall upon Minnesota? Through what rivers? (45) What industries are carried on in this state? (46) What crops are raised? (47) Name the three largest cities, and tell why each is important. (48) How does the largest compare with Boston? With Cincinnati?

Iowa (Ia.). — (49) Examine the maps (Figs. 324 to 334) to see what crops are raised in this state. (50) What other important industries are carried on? (51) Name the largest cities. For what noted? (52) Much corn is raised here; what must be done with it?

Missouri (Mo.). — (53) How do the summer and winter temperatures compare with those of Minnesota (see Figs. 63 and 64). (54) What influence must this have upon the crops? Examine Figures 324 to 334 to see how much influence this difference has. (55) Why are so few towns found in the southwestern part? (56) Name and locate the two largest cities. For what is each important? (57) What other cities are mentioned? (58) Find the population of St. Louis (table, p. 447); compare it with New York, Chicago, Philadelphia, and Boston. (59) Give what reasons you can for its great size.

Kansas (Kan.). — (60) Why are the cities confined to the eastern part? (61) What are the industries of the west? Why? (62) What crops are raised in Kansas (Figs. 324 to 334). (63) Name the principal cities. For what is each noted?

Nebraska (Neb.). — (64) How do the industries of Nebraska compare with those of Kansas? Why? (65) How are these states alike in regard to location of cities? (66) What cities in Nebraska are mentioned? (67) For what is Omaha noted? Why may we expect it to increase in importance in this respect?

North and South Dakota (N.D. and S.D.). — (68) These two states were formerly the *territory* of Dakota. What reason can you see for making two states out of the one territory? (69) How do the indus-

tries of the two states compare with those of Nebraska and Kansas? (70) Look at the corn and wheat maps (Figs. 324 and 326) to see where most wheat and corn are produced. Is North Dakota more or less important than Kansas as a corn-producing state? Answer the same for wheat. Tell why this is so. (71) Of what advantage would it be to Fargo if a deep river extended from that city to Duluth? (72) What do the Black Hills contribute to the wealth of South Dakota?

General. — (73) Which state is the largest in this group? (Table, p. 445.) Which smallest? Compare each of these with Mass., R.I., N.Y., N.C., and Tex. (74) Which of the Central States has the most inhabitants? (Table, p. 445.) Which the least? Compare each of these with Mass., R.I., N.Y., N.C., and Tex. (75) Find the ten largest cities (table, p. 448). How does their total population compare with that of the ten largest in each of the other groups of states?

SUGGESTIONS. — (1) Write a brief description of the Western prairies. (2) Find how much earlier in the fall frosts come in Minneapolis than in Memphis. (3) Mention several advantages of farm life over city life. (4) How do farms that you have seen differ from the Illinois farm described in the text? (5) Find other uses of corn besides those mentioned. (6) How does the wind often help ranch cattle to obtain food in winter? (7) What are some of the adventures that cowboys experience? (8) Why are coal and brick especially valuable in a prairie country? (9) Examine a brickyard, and write a description of brick making. (10) See how long a list you can make of articles manufactured partly or wholly out of copper. (11) Do the same in regard to lead. (12) How are the advantages of the location of Chicago somewhat similar to those of Atlanta? (13) Where is the flour that you eat manufactured? (14) Make a drawing of the great water route from Duluth to New York City, and put in the leading cities. What states border on this route? (15) Make a drawing of the Mississippi, Missouri, and Ohio rivers, and include the leading cities. What states do these rivers border or pass through? (16) State clearly the advantages of these water ways. (17) Make a sketch map of the Central States, including principal lakes, rivers, and cities.

For REFERENCES, see page 440.


DOMINION OF CANADA
WASHINGTON
OREGON
IDAHO
MONTANA
WYOMING
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
PACIFIC
ROCKY MOUNTAINS
Edmonton
Battleford
Calgary
Lethbridge
Moose Jaw
Regina
Kamloops
Vancouver
New Westminster
Nanaimo
Victoria
Strait of Juan de Fuca
C. Flattery
Port Townsend
Olympic Mts.
Seattle
Tacoma
Olympia
Everett
Whatcom
Puget Sound
Grays Harbor
C. Disappointment
Astoria
Vancouver
Portland
Mt. Rainier 14,526
North Yakima
Ellensburg
Spokane
Walla Walla
Columbia R.
Rossland
Nelson
Kootenai R.
Shuswap L.
Columbia L.
Fraser River
Mt. Hood 11,225
Salem
Albany
Eugene
Roseburg
Ashland
Crater L.
Klamath L.
C. Blanco
Coast Ranges
Cascade
The Dalles
Pendleton
La Grande
Baker City
Blue Mountains
Malheur L.
Warner Lakes
Owyhee
Mt. Shasta 14,380
Eureka
Cape Mendocino
Tuscarora
Winnemucca
Moscow
Lewiston
Wallace
Pend Oreille L.
Clark Fk.
Bitter Root Mts.
Salmon R.
Salmon
Weiser
Boise
Hailey
Idaho Falls
Pocatello
Shoshone Falls
Snake R.
Montpelier
Preston
Logan
Ogden
Great Salt Lake
Kalispell
Flathead L.
Missoula
Helena
Anaconda
Butte
Bozeman
Great Falls
White Sulphur Springs
Billings
Sweet Grass Hills
Ft. Assiniboine
Milk R.
Glasgow
Missouri River
Glendive
Miles City
Yellowstone R.
Big Horn R.
Powder R.
YELLOWSTONE NATIONAL PARK
Yellowstone L.
Fremont Pk. 13,790
Buffalo
Newcastle
Black Hills
Cheyenne R.
Casper
Rawlins
Rock Springs
Laramie
Cheyenne
Evanston
North Platte R.
Sterling
Little Missouri R.
N. Saskatchewan R.
S. Saskatchewan R.
125°
120°
115°
110°
105°
50°
45°
40


WESTERN STATES
Scale of Miles.
0 50 100 200 300 400
Cities with over 200,000: San Francisco
Cities with 50,000 to 200,000: Denver
Cities with 25,000 to 50,000: Tacoma
Smaller Places: Ogden
Capitals with less than 25,000: Phœnix
State Capitals: ⊙ Other Cities: •
NEVADA
Great Basin
UTAH
COLORADO
CALIFORNIA
ARIZONA
NEW MEXICO
TEXAS
MEXICO
OKLA.
KANSAS
LOWER CALIFORNIA
Gulf of California
OCEAN
Reno
Virginia City
Carson City
Austin
Eureka
Wheeler Pk. 13,058
Belmont
Pioche
Salt Lake City
Provo City
Springville
Utah L.
Nephi
Manti
Sevier L.
Wasatch
Beaver
St. George
Uinta Mts.
Great Salt Lake Desert
Greeley
Boulder
Denver
Mt. of the Holy Cross 14,006
Leadville
Aspen
Colorado Springs
Pikes Pk. 14,108
Cripple Creek
Canon City
Pueblo
Arkansas R.
La Junta
Ouray
Blanca Pk. 14,390
Durango
Trinidad
Raton
San Juan
Grand
Green
Santa Rosa
Sacramento
Stockton
San Francisco
Oakland
Alameda
San Francisco Bay
San Jose
Santa Cruz
Monterey
Yosemite National Park
San Joaquin R.
Fresno
Tulare L.
Mt. Whitney 14,898
Owens L.
Death Valley
Bakersfield
Randsburg
Mohave Desert
San Bernardino
San Bernardino Range
Pt. Conception
Santa Barbara
Pasadena
Los Angeles
SANTA BARBARA ISLANDS
San Diego
Colorado R.
Grand Canyon
Little Colorado
San Francisco Pk. 12,794
Flagstaff
Prescott
Phœnix
Salt R.
Globe
Florence
Gila R.
Gila Desert
Yuma
Tucson
Tombstone
Nogales
Taos
Santa Fe
Las Vegas
Canadian R.
Albuquerque
White Oaks
Socorro
Pecos R.
Roswell
Silver City
Carlsbad
Las Cruces
Deming
El Paso
Rio Grande
40
35
30
120°
115°
110°
105°
Longitude West from Greenwich
THE M.-N. CO.

FIG. 211.

XII. THE WESTERN STATES

Map Questions. — (1) Compare this group with each of the other sections in relief (Fig. 98); in climate (Figs. 46, 63, and 64); size (table, p. 445); population (table, p. 445). (2) Which is the largest state? The smallest? How does each compare in size with Massachusetts, Pennsylvania, and Texas? (3) What becomes of the water of the Humboldt River? (4) Name the five largest rivers; where does each rise, through what states does it pass, and where does it empty? (5) Name the principal mountain ranges; the plateaus (Fig. 96). (6) Which is the highest mountain peak? (p. 457.) (7) Where are the largest cities? Why there? (8) Find the Yosemite and Yellowstone parks. Why is it a good idea for the government to set aside interesting places as national parks? (9) Name the states having a seacoast. (10) Name those draining mainly or entirely into the Pacific. Into the Atlantic. Into the Great Basin.

Early Settlements. — While the pioneers were settling the prairies of the Central States, almost nothing was known about the Far West. The Spanish had taken possession of the Southern portion, and many of their names are still retained, as New Mexico, Los Angeles, and San Francisco. In 1848 gold was discovered

Fig. 212.

A Spanish mission in southern California — a relic of the days when that section belonged to Spain.

in the stream gravels of California, and hundreds of thousands of persons left farms, factories, and homes in a mad rush for the gold fields. Some sailed all the way around South America; others crossed the Isthmus of Panama; but many travelled overland, running the risk of attack from Indians and of death from thirst. There were then no railways west of the Mississippi, and the journey was long and tedious.

For ages the precious metal had lain scattered through the rocks of the Sierra Nevada Mountains. Then, as the mountains slowly crumbled, it had been washed into the streams. Most minerals decay when exposed to the air; but gold always remains bright. Being heavier than most minerals, the gold in the streams dragged along at the bottom, lodging here and there in the stream beds, oftentimes in little pockets or behind boulders where the current was checked.

It was this gold that the early gold hunters, or *prospectors*, were seeking, and they obtained it in a very simple manner. Placing some of the stream gravel in a pan of water (Fig. 342), they rocked it back and forth in such a way as to cause the heavier particles of gold to separate from the gravel, while the lighter minerals were thrown away. The prospectors were sometimes rewarded by finding large lumps of gold, called *nuggets*, worth hundreds of dollars.

The discovery of gold quickly drew so many persons to California that the territory was able to enter the Union as a state in 1850; and, as the search for the precious metal was carried farther and farther, the West soon became explored and settled. Railways were built across the mountains (Fig. 213), and many industries, such as farming, lumbering, and ranching, have followed mining. Indeed, in many sections these industries are now much more important than even gold and silver mining.

FIG. 213.

A railway winding about as it crosses the Rocky Mountains.

Physiography. — The Western States are made up almost entirely of plateaus and mountains. Most of the surface is more than a mile above sea-level, while some mountain peaks are two and three miles in height.

The extreme eastern portion is a continuation of the Great Plains (p. 248), which reach to the very base of the Rocky Mountains. These mountains (Fig. 211) extend entirely across the country into Mexico on the south and Canada on the north. They are made up of a large number of ranges and ridges, which attain their greatest height in Colorado.

A long distance farther west, and almost parallel with the Rockies, is another system of mountains, called the Sierra Nevada Mountains in California and the Cascade Ranges in Oregon and Washington. Still farther west, and close to the coast, is a third series, known as the Coast Ranges, which in places rise directly out of the ocean.

Fig. 214.

Compare the relief in this section with that of Figures 101, 122, 154, and 179.

Just west of the Rocky Mountains is a plateau, dotted with numerous mountain peaks and small ridges. It is higher at the two ends than in the middle, and may be divided into three parts (Fig. 96): (1) the great Columbia plateau of Idaho, Oregon, and Washington on the north; (2) the Colorado plateau of Arizona and Utah on the south; and (3) the Great Basin of Utah and Nevada between the two. The numerous short north and south mountain ranges in the Great Basin are called the Basin Ranges.

Between the Sierra Nevada Cascade system and the Coast Ranges there is an area of lowland (Fig. 214). In California and Oregon this forms a fertile valley; in Washington it is occupied by Puget Sound.

FIG. 215.
Mt. Hood, Oregon.

Throughout most of this Western country evidences of volcanic action abound (p. 8). Some of the loftiest peaks are extinct volcanoes, as Mt. Rainier, within sight of TACOMA, Washington; Mt. Hood (Fig. 215), not far from PORTLAND, Oregon; and Mt. Shasta, in northern California.

The influence of lava on the West is marked. For hundreds of thousands of square miles it forms the rock of the country, and through its decay has produced a soil which is very fertile. It covers the plateaus, especially in the north, and is one of the chief causes for the peculiar scenery of the West.

Even more important still is the effect of the lava upon the formation of minerals. Veins of gold and silver usually

occupy cracks in the rock which have been caused by the breaking of the strata while the mountains were forming. Through these cracks water passes, heated so hot by contact with the volcanic rocks that it is able to carry mineral matter in solution. As the water cools, on nearing the surface, it cannot hold all of its mineral burden in solution, and therefore deposits a part of the metal on the walls of these cracks. In this way many valuable veins of metal have been slowly gathered, and it is for these that thousands of miners are now searching.

Climate. — Unlike the East, where the climate is very uniform over large sections, the West is a region of contrasts, with a great variety of climate from place to place. The most general fact about the climate of this vast Western region is its aridity. Nearly everywhere it is so dry that no agriculture is possible without irrigation. Only among the high plateaus and mountains, and in the western parts of Washington, Oregon, and northern California, is there rainfall enough for forests or for farming. Thus, almost one-fifth of the entire continent is a partial or complete desert.

Along the northwestern coast the damp prevailing westerlies bring so much vapor that the rainfall is heavy (p. 51). Indeed, near the coast of Washington there is a rainfall greater than in any other part of the United States (Fig. 46), the heaviest rain coming in winter. But being robbed of its vapor in crossing the mountains, the air descends on the eastern side so dry that agriculture is possible only in a few sections, as in the high mountain valleys and in the wheat district of central and eastern Washington.

A part of Nevada, Utah, and Arizona is a true desert, and portions of each of the other states approach it. North of Great Salt Lake, for example, not a tree nor even a

shrub is to be seen for miles and miles. The entire surface is covered by a glistening whitish substance called *alkali*. In other regions dreary wastes extend hundreds of miles, interrupted only by cacti and a few other arid land plants, by rocky ledges, and by occasional mountain peaks.

The lack of water is shown on the map by the scarcity of streams in and near Nevada. That section is a real basin, having a rim higher than the centre, and is called the *Great Basin* (Fig. 96). Its few streams either flow into shallow salt lakes, which are growing more and more salt as the years pass, or they dry up and disappear in the sand.

FIG. 216.

Some of the giant trees that grow in the rainy Northwest.

That rain falls on the cool mountains and plateaus of the West is proved by the numerous large rivers which have their sources there. Name and locate those flowing from the Rocky Mountains into the Mississippi. Trace the Rio Grande and the rivers that empty into the Pacific Ocean. Although long, these rivers are not navigable, partly because of the steep slopes, and partly because of the lack of water. Indeed, during the dry summer season, many, like the Rio Grande, almost disappear in the middle part of their course.

The importance of even the higher plateaus in condensing the vapor is well illustrated by the highlands of central Arizona. A person travelling eastward from Los Angeles, on the Atchison, Topeka and Santa Fe Railway, upon reaching the Colorado River in the evening, finds himself in the midst of a desert about 500 feet above sea-level. If it is summer, the thermometer may register from 110° to 120° in the shade, for this is the hottest region in the United States, hotter than many parts of the torrid zone. After leaving the river, the train ascends the Colorado plateau, 7000 feet high, and the next morning the traveller is in the midst of a forest, while the almost unbearable heat of the previous day is replaced by a delightfully cool air. As if by magic the scene is changed, simply because, on the elevated plateau, the air is cooler and the vapor can therefore be condensed into rain.

Mineral Products. — As we have already seen, mining was the first industry to attract large numbers of pioneers to the Far West. Every one of the Western States contains mineral deposits of some kind, as gold, silver, copper, lead, mercury, and coal. This region is now the most important mining district in the world.

Much of the land is still owned by the government and all ore that is discovered upon it belongs to the finder. Any citizen of the United States may become the owner of a valuable mine, if he can find one on government land. Consequently, hundreds of prospectors are digging tunnels into the earth wherever they believe they may obtain ore. In most cases they are doomed to disappointment, but they keep on, moving from place to place. Sometimes, however, valuable ore is found, and then the poor prospectors become suddenly rich.

Much gold has been discovered in the gravels of stream beds where water no longer flows. In many places these

dry beds are near the surface, so that mining is easy; in others, they have been covered up by a thick blanket of hard lava, beneath which the miners are obliged to tunnel in order to follow them.

Very early the miners became dissatisfied with the slow "panning" of the gold, as washing the gravel in pans was called (p. 282). They then adopted the far more

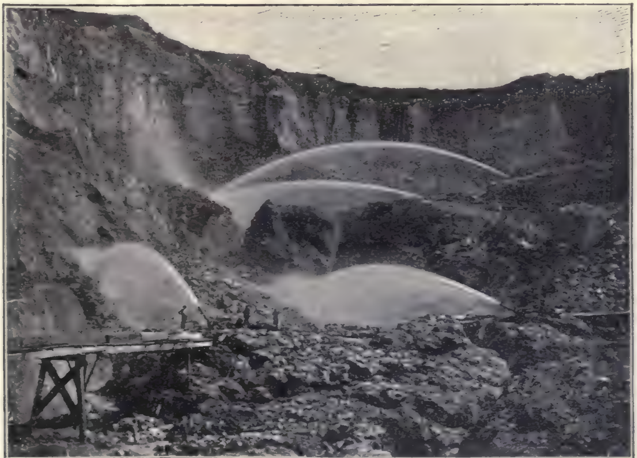


Fig. 217.
Washing gold from gravel beds in California by means of hydraulic mining.

speedy plan of *hydraulic mining*. By this method a powerful stream of water is turned against a gravel bank from the nozzle of a pipe line, washing the gravel rapidly away (Fig. 217). The water, gravel, and gold are led into steeply sloping troughs, or *sluices*, which have numerous little bars of wood, called *riffles*, across their bottom. The water, with its load of gravel, rushes over the riffles to the end of the sluices, where the coarser gravel is dropped;

but the gold, being so heavy, settles to the bottom of the sluices and is caught behind the riffles, where it is later collected.

Much gold has been obtained from the gravels of other western states besides California. For example, even the gravel out of which some of the streets of HELENA, Montana, are built has been washed for gold.

FIG. 218.

Ouray, a thriving mining town in Colorado, nestled in a mountain valley and enclosed by lofty mountain peaks.

Another method of mining gold, and the one by which most of that metal is now obtained, is to dig into the solid rock. The shafts and tunnels follow the veins from which the gold in the gravels originally came. In the veins, the metal is found mixed with other minerals which are of little or no value; but the gold occurs in such small grains that one may spend days in a mine looking for it, without *seeing* any.

One of the most remarkable mining districts in the world was that of the Comstock Lode at VIRGINIA CITY, Nevada. The vein was irregular in richness, some parts, called "bonanzas," containing so much gold and silver that vast quantities

were taken out, while elsewhere it was much more barren. So much metal was obtained from this single vein that Nevada at one time produced more silver than all the other states put together, and more gold than any other state in the Union. So many people moved there then that Nevada territory became a state in 1864; and Virginia City, though in the midst of the desert, grew to be a thriving city.

As the mines went deeper, hot water with a temperature of 170° entered. This caused the temperature in the mine to be almost unbearable. Ice-cold air was forced in, and machinery and mules were made to do most of the work; but even then men fainted at their posts, and the mine was finally abandoned. In consequence of this, people drifted away from Virginia City, and the population of Nevada decreased. What is its present population? (See p. 446.) Compare it with New York City in population (see p. 447). With the large city nearest to your home.

Fig. 219.

A western stage coach bringing a crowd of miners into a newly discovered mining camp, as miners were carried into Cripple Creek a few years ago.

At the present time Colorado produces more gold and silver than any other state (Figs. 342 and 343), and much copper, lead, iron, and coal, besides. Among the mountains, one sees mines almost everywhere; but one of the most noted mining districts is near Leadville, a city at an elevation of over 10,000 feet above sea-level. Another

well-known mining town in Colorado is CRIPPLE CREEK. A few years ago no town existed there, and the ore, which has now become so valuable, was not recognized as ore by the prospectors. Finally, when some one discovered the gold, at once, as in previous cases where that metal has been discovered, thousands of people rushed in from all directions and a city sprang up almost in a day.

After the ore is taken from the mines it must be crushed, the worthless parts must be washed out, and the remainder sent to the *smelters* (Fig. 220), where the metal is obtained by

FIG. 220.

A smelter at Great Falls, Montana.

a complicated process. The machinery for crushing and smelting is so expensive that ores from many mines are sent to one place, and must sometimes be carried a long distance. The mines near LEADVILLE send their ore to that city; but many mines in Colorado ship ore to the smelters at DENVER and PUEBLO.

The western half of Montana is another great mining section. HELENA has already been mentioned (p. 290); but no portion of the state is now so important for mining as BUTTE. There the principal metal is copper, although some gold and silver are mixed with the ore. More copper is produced at Butte than in any other min-

ing district in the world. The mines are very extensive, reaching several thousand feet into the earth and having miles of tunnels, through which one might wander for days without finding his way out.

Much of the ore is crushed and reduced in smelters within the city limits. In the process, fumes of sulphur pour forth from the tall chimneys, and settle to the ground, killing almost all vegetation, and causing the city and its immediate surroundings to present a barren, desolate appearance.

As in Colorado and Montana, the principal industry in Arizona is mining, much copper, silver, lead, and gold being produced. One of the largest cities in the territory is TUCSON, which, together with the others, is mainly engaged in business connected with mining. There is also much mining in each of the other Western States, especially in Idaho, Utah, and New Mexico.

Iron is found in several of the states, but it is not mined to any extent excepting west of PUEBLO, in Colorado. Coal, usually of poor quality, also occurs in many sections; but a very good grade of coal is produced in Colorado, and in the state of Washington.

Lumbering. — Because of the extensive development of mining there is much lumbering. The Butte mines alone consume millions of feet per year. In the mines heavy timbers are placed upright and close together on each side of a tunnel, with crosspieces overhead, to prevent the rock from caving in. Because of the great pressure upon them, timbers more than a foot in diameter are often broken.

While a great portion of the country is arid, the mountains and some of the higher plateaus are forested. Thus the mines, which are usually among the high mountains,

FIG. 221.

A lumbering scene in Washington. Here oxen draw the sections of logs.

are generally supplied without difficulty, for the logs are easily brought down to them from above.

In the damp, equable climate near the northwestern coast, are forests of giant redwood, fir, cedar, and spruce trees which grow to a greater size than any other trees in the world (Figs. 47, 216, and 221). While the logs in Maine and Michigan are rarely more than two or three feet in diameter, many in Washington and Oregon are from six to ten feet through, and some in California are very much larger.

A visit to a lumbering camp near Tacoma will show that, owing to the size of the trees, and to the climate, the work is carried on very differently from lumbering in Maine (p. 127).

The men are able to work both winter and summer. They select a tree which perhaps towers upward for two hundred feet, — that is higher than most church steeples, — and contains as much as fifteen thousand feet of lumber, or enough, when sawed into boards, to build a small house. Two men saw and chop at this tree for nearly an hour (Fig. 222), until the giant begins to quiver. When finally it falls, a wonderful sight may be seen. The tree bends slowly over, quickens its movement, then falls to the ground with a mighty roar, breaking good-sized trees, against which it falls, as if they were twigs.

FIG. 222.
Chopping down a tree in Washington. The men stand on platforms so as to reach above the decayed wood near the base.

After the branches are removed, the tree is sawed into logs of different

FIG. 223.
One of the great logs ready to be removed from the forest in Washington. A small engine, used to draw the logs to the railway, is also shown.

lengths, as twenty-four, thirty-two, forty-eight feet, and these are dragged to a railway which leads up into the forest. Several of these sections are then fastened together, one behind the other, and dragged between the rails to the foot of the mountain several miles away. There they are piled upon flat cars and taken to the mills, a single section sometimes occupying an entire car. Many go to TACOMA and SEATTLE, where there are enormous sawmills. Since there is so much lumber, many of the streets of Tacoma, and other places in this region, are paved with thick planks instead of stone or asphalt.

FIG. 224.

Harvesting wheat in the great wheat fields of the Palouse region of Washington. By this machine, drawn by many mules, the wheat is both cut and the seed removed at the same time. A farm must be very large to make such an expensive machine pay.

Agriculture. — Farming is carried on extensively in the well-watered section of the Northwest (Fig. 224). This is a wheat-producing country like the Red River valley. Indeed, some of the farms are even larger than the Dalrymple farm (p. 246). Barley is another common grain and much hay is also raised. During harvest season the air is so dry that both hay and grain may be left out for weeks with little danger of being spoiled by rain.

Great quantities of fruit are also raised in this region. In the north apples, pears, and grapes are produced; but in the south, as for instance near STOCKTON, and SACRA-

MENTO, the capital of California, are groves of oranges, lemons, olives, and figs, as well as other trees which grow only in warm climates.

But the only way in which farming is possible in most other parts of the West is by means of irrigation (Fig. 226). The influence of irrigation is well illustrated in the region near DENVER, which is in the midst of an arid plain. This is crossed, however, by the South Fork of the Platte River, from which a ditch as large as a canal is led out upon the plain. The river itself has a rapid fall; but just enough slope has been given to the ditch to secure a flow of the water. By this means the land between the ditch and the river is at a lower level than the ditch, and may therefore be reached by the water.

Smaller branches are led off from the main ditch, and each of these is divided and subdivided to supply farms along its course. When a field needs water, the ditch is tapped and the field flooded, or else the water is led into little furrows a few feet apart. The method followed depends upon the kind of crop that is under cultivation. As there is danger that the supply of water may not last through the summer, reservoirs (Fig. 225) are built to store the water from the spring freshets; and when needed, this is allowed to flow into the ditch.

FIG. 225.
A reservoir for irrigation near San Diego, California.

Of course such an arrangement is expensive, and each

farmer must pay for his water at a certain rate, as each house in a city pays for its water or gas. That one can afford to do so is well shown in this case. On the upper side of the ditch, which cannot be reached by the water, the land is fit only for grazing; but that which can be irrigated is covered with cultivated fields of grain, vegetables, and alfalfa. The latter is a very nutritious plant which, like clover and hay, is fed to stock.

Without irrigation, crops could not be grown in this vicinity, but would need to be brought several hundred

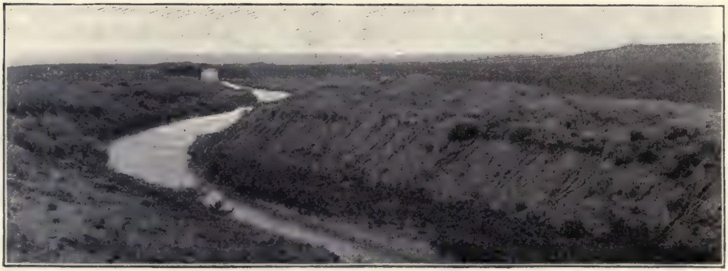


Fig. 226.
An irrigation ditch on the plains near Billings, Montana.

miles, from Kansas, Nebraska, and other states. It is evident, therefore, that irrigation must have had a great influence on the settlement of the West. Without it Denver and Pueblo would not be the cities that they are; and, because of the difficulty of obtaining food, scores of mining towns would not be in existence.

Wherever the waters of the rivers are led out over the fields, people form settlements and often small cities. That is the case at Greeley, Colorado, Cheyenne and Laramie, the principal cities in Wyoming, and numerous other places.

One of the best farming districts in the arid lands is in Utah. Most of that state was originally almost a desert, but large areas have been entirely changed by the Mormons, a peculiar sect organized by Joseph Smith in New York in 1830. Under the leadership of Brigham Young these people migrated into the then unknown West and settled a few miles from Great Salt Lake. There they commenced to build SALT LAKE CITY, which is now one of the most beautiful cities in the country. They also began to raise crops by irrigation, to plant fruit trees, and to convert portions of the desert waste into beautiful gardens.

Since the Mormons discouraged mining as much as possible, until recently mines were little developed in Utah. For a while they also succeeded in keeping out the "gentiles," as they called those who did not accept their teachings. Meanwhile their own numbers increased rapidly, and they spread even into Wyoming, Idaho, and other places where it was possible to raise crops by irrigation.

With the discovery of rich ores, however, other people have pushed into Utah, building the railway centre of OGDEN north of the capital, and now making up fully one-third of the population of Salt Lake City itself.

Southern California is a third section noted for its extensive irrigation. The mountains of the neighborhood condense the vapor, and the water is led into long irrigating ditches and stored in immense reservoirs (Fig. 225). The region is far south and its shores are bathed by warm ocean waters, so that the climate is warm and delightful. Although the land is by nature almost a desert, the addition of water to the fertile soil has changed the country about LOS ANGELES to one of the garden spots of the world. This region produces oranges, lemons, peaches, pears, grapes, figs, olives, walnuts, almonds, and many other kinds of fruits and nuts.

FIG. 227.

An irrigation ditch that supplies water to some of the orange groves of southern California.

Among the fruits the most common is the orange, especially the seedless navel orange. In the neighborhood of Los Angeles every home has its orange trees, and in many cases is entirely surrounded by groves of them. The winter season is the harvest time for oranges, which begin to be picked from the trees about the middle of November and continue to be gathered until February or later. They are cut from the trees, sorted according to size (Fig. 230), then packed in boxes and shipped away.

FIG. 228.

An orange grove near Los Angeles. Notice the snow-capped mountains in the background from which water for irrigation is obtained.

The groves of all kinds are planted in straight rows, and are kept so clean by frequent ploughing that scarcely a weed is to be seen. In this respect

they contrast very strikingly with the orchards, overgrown with grass and weeds, that are seen upon farms of the East.

Besides fruit in the fresh state, immense quantities of fruit, such as peaches, prunes, apricots, grapes (Fig. 231), and figs, are dried, usually by exposure to the sun. In the Eastern States fruit would decay if left out of doors; but in the sunny climate of the arid lands it dries quickly. Great quantities of fruit are also canned, as near Baltimore and elsewhere in the East.

Fig. 229.
Picking oranges near Los Angeles.

Thousands of persons from the East were originally attracted to southern California by the mild climate; but seeing the opportunity for fruit raising, they started orange groves. As a result of this, Los Angeles has rapidly grown to a city of more than a hundred thousand inhabitants (Fig. 247), while near by are numerous smaller cities. Land that a few years ago was almost a desert, and worth at best only a few dollars an acre, now supports flourishing groves of fruit.

Fig. 230.
Sorting and packing oranges.

Fig. 231.

Raisins drying between the rows of grape vines in a California vineyard.

So important is irrigation that it is being introduced wherever possible; and every year new irrigation systems are being built, some of them at great expense. One of the future problems of the West is how to store the water of the melting snows until needed by the summer crops.

Ranching. — There is so little rainfall in the arid West that only a very small fraction of the land can be irrigated. This leaves most of the country suited only

Fig. 232.

A view in the ranch country of the Great Plains.

to grazing; and wherever there is water enough for the animals to drink, cattle, horse, and sheep ranches are found (Fig. 232). In some parts, especially where the grass is scanty, herds of goats are raised.

The manner in which a cattle ranch in Dakota is conducted was described on page 248, and much the same plan is followed for cattle and horses in the Western States. Sheep ranching is conducted somewhat differently, as can be seen from the ranches about BILLINGS, Montana. A

FIG. 233.

A herd of sheep in winter, feeding in a field of alfalfa near Billings, Montana.

good-sized ranch has from twenty-five thousand to forty thousand head of sheep, which, like cattle, may be fed partly upon the government land, or the ' range," and partly on land fenced in and owned by the ranchman. During the coldest winter weather the sheep are in many cases driven into protected *corrals* and fed on alfalfa (Fig. 233), because the snow on the range sometimes becomes so deep that they cannot obtain food. However, the fierce winds of the open plains help them by drifting the snow and thus leaving open patches where they can find grass.

When the sheep are feeding on the range one man with a dog (Fig. 234) can herd twenty-five hundred; and, with a horse in addition, he sometimes takes care of five thousand. Selecting some spot near water for a camp, the herder drives his sheep out each morning and back at night, going each day a distance of a mile or two from camp. When the grass is eaten in one place, the camp is moved; then, from another point as a centre, they wander out as before.

FIG. 234.

A sheep herder, and his flock of sheep.

The life of the herder is extremely lonesome, both day and night being spent with the sheep. Once a week a man comes to bring him food; and for weeks, and even months at a time, that is the only company he has, aside from his sheep, his dog, and possibly his horse.

After the winter is over, the first profit to the ranchman comes from the sale of the pelts of sheep which have died during the cold weather. He expects a loss of about five per cent a year from this cause; and wolves also take some.

The next harvest comes from the wool. Men who make it their business to shear sheep travel in squads of about twenty-five. They erect sheds and pens near some sheep centre, such as BILLINGS, and shear all the sheep that are brought to them. Sometimes sheep are sheared at the ranch; but many consider it more desirable to drive them near to a market, thus saving the expense of drawing the wool a long distance to the railway station (Fig. 235). In this way the sheep also secure food on the range while on the journey to and from the market.

In the Southwestern States sheep are often sheared twice a year; but further north it is done only once, and then as near

FIG. 235.

A load of wool, drawn by twelve oxen, entering Billings after a long journey from a distant ranch.

the month of June as possible. Can you suggest a reason for choosing that time? After the wool is cut, it is pressed into bales and shipped to various markets in the East. Where should you think it might be sent, and for what purpose used?

From July on, many sheep are sold for mutton. Those that are from three to five years old, and that have already borne a quantity of wool, are usually selected for this purpose. The hides are useful for leather, the bones for fertilizing the soil, and the tallow for candles.

Territories. — Arizona and New Mexico are still territories, although Arizona has twice as many inhabitants as

FIG. 236.

A Navajo Indian girl and one of the blankets woven by these Indians.

the state of Nevada, and New Mexico nearly four times as many.

This is the region in which some of the most highly developed Indians were discovered by the Spaniards (p. 94), and here some of their descendants still occupy reservations. However, much of the country is now occupied by Americans and Mexicans, who have formed large settlements, such as ALBUQUERQUE, the largest city in New Mexico.

The Pueblo Indians are especially interesting, for some of them still live after the manner of their ancestors. Their homes are built of sun-dried clay, or *adobe*, and in some cases are entered from the roof by means of a ladder (Figs. 80 and 237). They were intended as strongholds for the storing of grain and for protection against wandering tribes which might attack them at any time. Other Indian houses, the *cliff-dwellings* (Figs. 238 and 239), were built on the sides of

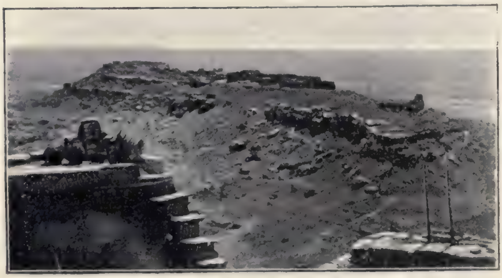


FIG. 237.

On the rocky flat-topped hill, well above the surrounding country and difficult to reach, is one of the Indian pueblos. It is the square mass, looking somewhat like rocks, in the middle of the hill.

cliffs beneath overhanging ledges; and still others, *cave-dwellings* (Fig. 240), were in caves dug out of the rocks.

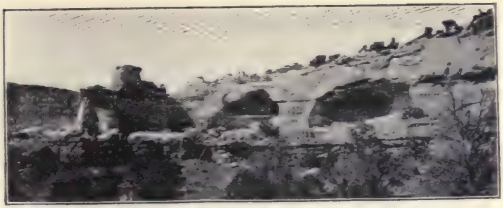


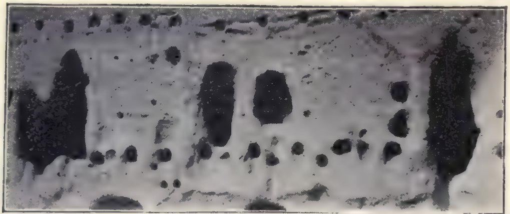
Fig. 238.

Cliff-dwellings, built in the caves beneath the overhanging cliffs.

Among the early Spanish settlements is the quaint city of Santa Fé, the capital of New Mexico. There, as elsewhere in the territory, the houses are mostly low, one-story, adobe buildings (Fig. 241). Spanish is the language most commonly heard, and on all hands one sees the primitive customs of a century ago. For instance, wheat, instead of being threshed out by machines, is often spread upon the ground in an enclosure and tramped by goats until the grain is separated from the hull. The grain is then tossed into the air in order that

Fig. 239.

Houses of the cliff-dwellers.



the wind may carry away the chaff. However, in many parts of New Mexico and Arizona, mining and

Fig. 240.
Cave-dwellings in New Mexico.

Fig. 241.
A view in a New Mexico town, showing the low adobe houses in which the Mexicans live.

other industries are well developed, and there are many American residents.

Scenery

In many places among the mountains there are sights comparing favorably with those of the Alps, which attract so many Americans abroad. Fine views, strangely formed cliffs, deep canyons, and imposing waterfalls are present without number. But among all the interesting places there are three that easily surpass the others in magnificence and grandeur. These are the Yellowstone National Park, the Colorado Canyon, and the Yosemite Valley.

The Yellowstone Park.—This region, chiefly in Wyoming, is a tract of land, larger than Connecticut, which the government has set aside as a national park. It is often called the "Wonderland of America." Among the many objects of interest are boiling springs, boiling mud springs of different colors, deep canyons, and waterfalls. Some of the springs are on the level of the ground, so that

one must be on the constant outlook lest he step into one; others are surrounded by a rim several feet high.

A stage road leads from the Northern Pacific Railway to the Mammoth Hot Springs on the northern side of the Park. There, from openings in the hillside, heated water flows down over beautifully colored terraces which have been built by a deposit of mineral matter brought by the water. Farther on are boiling springs, and here and there is one, called a *geyser*, from which hot water and steam occasionally burst forth with great violence, sometimes to a height of 100 or 200 feet (Fig. 242). "Old Faithful," one of the most regular of these, plays at intervals of 65 minutes, to a height of 100 to 130 feet. Others discharge at much longer periods, as two to three hours, or several days; and in some cases the roar of escaping steam lasts for hours after the water has all been expelled. The outbursts are really explosions of steam, the heat being supplied from deep in the earth.

Fig. 242.

An eruption of one of the geysers of the Yellowstone Park.

Beyond the geyser basins the Yellowstone Lake is reached, a beautiful sheet of water, nestled in the mountains at a height of nearly 8000 feet above the sea. Its waters flow northward, forming the Yellowstone River, a tributary of the Missouri. To many persons, the falls and canyon of this river are the greatest wonders of the Park. Soon after leaving the lake, the stream narrows and quickens, and the water leaps 109

feet directly downward. A short distance farther on it tumbles 308 feet farther, or almost twice the height of Niagara. It then runs between banks which extend 1000 feet above it.

The canyon is somewhat winding, with numerous bold cliffs jutting far out into the abyss; and from these, wonderful and inspiring views may be obtained. Far below, one sees the silvery stream, too distant to be heard as it dashes along. Across the chasm, a half mile away, dark green pines fringe the bank; and between the water and these woods are gorgeously colored rock strata, having all the colors of the rainbow.

Colorado Canyon. — One portion of the Colorado Canyon, in Arizona, may be reached on the Atchison, Topeka and Santa Fé Railway. The wonderful Yellowstone Canyon, just described, is a pygmy compared with this.

As one first looks out over the canyon he sees nothing but towers, pinnacles, many-colored layers of rock, and apparently bottomless depths. When he finally takes a position from which the thread-like stream below can be spied in the abyss, it seems almost impossible that so little water could have wrought such mighty havoc.

The difficult path which leads to the bottom is seven miles long, and the trip down and back is a full day's journey; but without making it, one fails to appreciate fully the marvellous carving, sculpturing, and coloring. At the bottom the scene is entirely changed; and, as one looks upward to see himself shut in by walls which seem to extend to the very heavens, his own littleness and the immensity of the work of Nature are wonderfully impressed upon him.

For three hundred miles the river flows at the bottom of this deeply cut canyon, and hence serves as a very complete barrier to travellers. A person living on one side, where he could look across to the other side, ten miles away, would need

FIG. 243.

A view in the Colorado Canyon.

to travel hundreds of miles to reach that side; for there are no railways or roads leading across.

Yosemite Valley. — This wonderful valley, on the western slope of the Sierra Nevada Mountains, in California, presents very different views from those already described. Some of the most magnificent are formed by the Yosemite River, which pours over a precipice into the valley below. In one mighty leap the water descends 1500 feet, forming the Yosemite Falls which are famed the world over. Below this are some cascades, then another fall of 400 feet.

Near the fall are seen the giant trees of the world, the largest of which is 31 feet in diameter.

The Cities

Cities in the Interior. — Large inland cities in the Western States are very few in number, the greatest being DENVER, the capital of Colorado. This city is located on the site of a small mining camp; but its growth is chiefly due to two facts: (1) the numerous mining towns among the mountains, and (2) the near presence of water, which has made irrigation on a large scale possible (p. 297). The first fact calls for an important trade centre somewhere in that region, and the second makes it possible to secure food.

Denver has now become a railway and manufacturing centre, where ore is smelted, and machinery, flour, and cloth manufactured. It is also of importance as a health resort, for its altitude of over five thousand feet, and its dry climate, render it especially adapted to persons suffering from lung trouble. COLORADO SPRINGS, south of Denver and near Pike's Peak, is one of the leading health resorts in the country.

PUEBLO, a trade and manufacturing centre, is situated where the Santa Fé line meets the Denver and Rio Grande Railway. In this city much ore is smelted, and iron goods are manufactured. It is its nearness to coal and iron ore which makes the latter industry possible.

A number of interior cities, such as SALT LAKE CITY, OGDEN, and BUTTE, have already been mentioned (pp. 292 and 299). Name some others. None of the other inland towns in these states are very large, and whatever importance they have is due chiefly to mining, farming by irrigation, and grazing.

Cities on the Pacific Slope. — The largest city in all these states is SAN FRANCISCO (Fig. 244), located on a remark-

FIG. 244.

Map to show the location of San Francisco, Portland, Tacoma, and Seattle.

ably fine harbor which was formed by the sinking of the coast, as the harbor of New York City was formed. As in that case, too, there are other important cities near at hand — the largest being OAKLAND. Close to San Francisco are the two most important educational institutions in the Far West, — one, the University of California, at BERKELEY (Fig. 244), the other, Leland Stanford Junior University, a short distance south of San Francisco. Farther south is SAN JOSÉ, and to the northeast is SACRAMENTO, the capital.

FIG. 245.

The capitol building at Sacramento, one of the most beautiful state capitols in the country.

The enormous crops of wheat, fruit, and wool in northern California suggest some of the occupations in these cities. What are they? Owing partly to an insufficient supply of coal, manufacturing is not so extensively developed as might be expected. One sees the effect of this lack of coal on the railways, for wood is a common fuel on the engines in Oregon and northern California, while in southern California steam is often generated by the use of petroleum, obtained from the oil wells of LOS ANGELES and vicinity. It is not surprising, then, that most of the wool raised in the West is shipped to the East to be

manufactured into clothing, blankets, etc., even though some of these articles must be sent to California to be sold.

Nevertheless, San Francisco has founderies and machine shops, flour and woollen mills, sugar refineries, canning factories, breweries, and distilleries. The principal products sent away from the state are gold and silver, wine, fruit, wool, and grain, some going East by rail and some by water. This is the greatest shipping point on the

FIG. 246.

A scene in "Chinatown" in San Francisco.

Pacific coast; and, as our trade with the Philippines, Hawaiian Islands, and other Pacific countries increases we may expect San Francisco to grow rapidly.

An interesting portion of this city is the section called "Chinatown" (Fig. 246). Chinese are very common in some parts of the West; and since, for a long time, San Francisco was their chief landing place, many thousands have collected there, who live huddled together in hovels, almost like rats.

Owing to the fact that mountains rise almost from the sea, there are few harbors on the west coast; and those that are found are at places where, in the course of mountain growth, the land has been lowered. The next important harbor south of San Francisco is the port of Los Angeles, twenty miles from Los Angeles itself. A still better one, however, is still farther south at San Diego. Estimate the distance of these points from San Francisco (Fig. 244).

Fig. 247.
A street in Los Angeles.

The first good harbor north of San Francisco is that of Portland (Fig. 244), situated on a small branch of the Columbia River, near the head of deep-water navigation, about one hundred and twenty miles from the sea. Most of the other important towns of Oregon are inland, and Portland has grown to be the chief shipping point by water. From this point wheat, wool, and lumber, the leading products of Oregon, are shipped in great quantities. Portland has extensive manufactories of woollen goods, flour, and furniture; and Salem, the capital, also has large woollen and flour mills.

Farther down the Columbia are several towns, the largest being Astoria, where, as elsewhere along the river, the salmon industry is developed. The salmon, like the shad of the East (p. 163), although spending its life in the ocean, passes up the

rivers to *spawn,* or lay its eggs, in fresh water. In their passage the fish are caught in great numbers (Figs. 248 and 249), and some are shipped away in ice, even across the continent to Eastern cities. Others are sent to the numerous canning factories along the lower Columbia, where they are packed in cans and cooked (see also pp. 358–360).

FIG. 248.

Catching salmon in dip nets as they leap up over the falls on their way to the waters where they spawn.

Washington, unlike Oregon, has many good harbors. On two of these SEATTLE and TACOMA (Fig. 244) are situated; but SPOKANE, the third city in size, is located near some falls of the Spokane River in the eastern part of the state. Coal, lumber, grain, and hops are the principal exports. There is also extensive manufacture of flour at Spokane, and of lumber and furniture along the shores of Puget Sound, especially at Seattle and Tacoma.

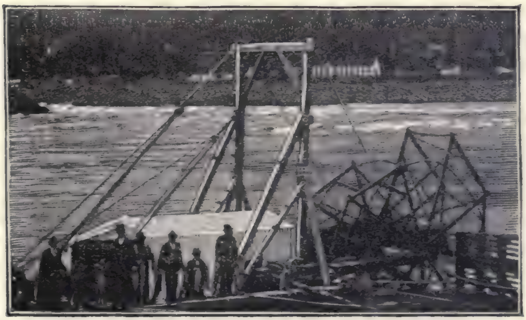


FIG. 249.

A wheel, with a net on it, which revolves in the current and lifts the salmon from the water as they swim past.

These goods are shipped away in large amounts, some going to the Eastern cities, some to China, Japan, the Philippines, Alaska, and other countries.

On Figure 355 notice what great lines of railway cross the continent to the Pacific coast, and in what cities they terminate. What about the number of railways on the Pacific coast compared with those on the Atlantic?

QUESTIONS AND SUGGESTIONS

Review Questions and Topics. — (1) Tell how California became settled. (2) How did gold get into the streams? (3) How did the prospectors obtain it? (4) Describe the physiography: — the mountains and plateaus; the volcanoes; their effects. (5) Tell about the climate: — the aridity; the rainy Northwest; the deserts; the effect of plateaus and mountains. (6) What minerals are found in the West? (7) Tell about the prospectors. (8) Describe hydraulic mining. (9) What kind of gold mining is now most common? (10) Give the history of the Comstock Lode. (11) What effect did it have upon Nevada? (12) What state now produces most gold and silver? (13) Name and locate the principal mining towns in Colorado. (14) What must be done with the ore? Where is it done? (15) Name and locate the principal mining town in Montana. (16) In Arizona. (17) Where is copper found in these states? (18) Where is coal chiefly found? (19) Where are the forests? Why? (20) Describe lumbering near Tacoma. (21) What are the farm products of the sections that are well supplied with rain? (22) State the plan for irrigating the land near Denver. (23) Tell how irrigation has influenced the settlement of the West. (24) Name some cities that have irrigation systems. (25) Tell about the Mormons. (26) Describe the fruit region of southern California: — the appearance of the country; the climate; the products; what is done with them; the cities; the importance of water. (27) Why is ranching carried on in the West? What animals are raised? (28) Tell about sheep ranching: — number of sheep; care given them; shearing; uses of the products. (29) Tell about the Indians of New Mexico and Arizona. (30) About the primitive customs of the Mexicans. (31) Describe the Yellowstone Park: — location; size; springs and geysers; the canyon. (32) Describe the Colorado

canyon. (33) The Yosemite Park. (34) Name the principal inland cities, telling for what each is important. (35) What cities are on or near San Francisco Bay? For what important? (36) Tell about San Francisco. (37) Name the harbors south of San Francisco. (38) Describe the location and industries of Portland. (39) What is done at Salem? (40) Tell about the salmon industry. (41) Name the cities of Washington. For what is each important?

REVIEW BY STATES: *Montana* (*Mont.*). — (1) What industries are carried on in the eastern part? Why? (2) What industries in the western part? (3) Name the cities mentioned in Montana, and tell for what each is important. (4) What two large rivers drain this section? (5) Through what states do they flow before reaching the Gulf? (6) Draw an outline map of the state; and, as each of the other states is studied, do the same for it.

Wyoming (*Wy.*). — (7) What industries are carried on in this state? (8) What cities are mentioned? In what connection? (9) Find the Yellowstone Park, and tell for what it is noted. (10) On the maps showing principal grain-producing regions (Figs. 324, 326, and 328), Wyoming is a state where very little is produced. Why so little there?

Colorado (*Col. or Colo.*). — (11) Examine Figures 324 to 349 to see what is done in Colorado. (12) Give the reason why there is more water for irrigation in this state than in some of the others. (13) Trace the divide between the Pacific and Atlantic drainage, as it crosses Colorado. Trace it northward to Canada and southward to Mexico. (14) Name the cities in Colorado mentioned in the text, and tell for what each is important. (15) Find the population of Denver (table, p. 449). Compare it with the largest city in each of the other Western States, and also with New Orleans, Buffalo, and St. Louis.

New Mexico (*N.M.*). — (16) What about the inhabitants? (17) What is said about the industries? (18) Find how large the largest city is (table, p. 448). (19) Compare it with the largest city in Massachusetts. In Nevada.

Arizona (*Ariz.*). — (20) Tell about the river which crosses the territory. (21) What city and industries are mentioned? (22) Examine the maps, Figures 46, 63, and 64, and tell about the temperature and rainfall of Arizona. (23) How does the largest city compare in size with the largest in New Mexico? In Colorado?

Nevada (*Nev.*). — (24) For what was Nevada once famous? (25) Find its present population (table, p. 446). Why are there so few people?

Utah. — (26) Tell why the Great Salt Lake is salt (see First Book, p. 55). (27) What are the industries of this state? (28) What cities are mentioned? Tell about each. (29) Examine the maps, Figures 326 to 347, to see what products come from Utah.

Idaho (*Ida.*). — (30) What metals are obtained? (See Figs. 341 and 343.) (31) What great river drains Idaho? (32) What mountain range forms the eastern boundary?

Washington (*Wash.*). — (33) Compare the coast line with that of Oregon; of Maine. (34) Tell about the rainfall of this state. Compare it with Montana. Why this difference? (35) What effect has the rainfall upon the industries? What are the principal industries? (36) What cities are mentioned in the text? Tell about each.

Oregon (*Ore.*). — (37) What advantage do you see in the location of the largest city? (38) Compare it in size with Denver, New York, Boston, and New Orleans. (39) Examine the maps (Figs. 326 to 347) to see what is produced there. (40) What industries are mentioned in the text? (41) What cities are mentioned, and in what connection?

California (*Cal.*). — (42) Examine the rainfall map (Fig. 46). Explain the difference between northern and southern California (pp. 49 and 51). (43) What rivers drain most of this state? (44) Describe the relief. (45) Name the cities mentioned; for what is each important? (46) What industries in the state? (47) What advantage do you see in the location of San Francisco? (48) Compare its population with that of Boston, New Orleans, Denver, and Chicago. (49) What caused the early growth of California? What effect has that had on the other Western States? (50) To whom did California belong before we obtained it?

General. — (51) Which state has the largest population? (See table, p. 445.) The smallest? (52) Compare each with Massachusetts, Rhode Island, New York, and South Carolina. (53) Name the ten largest cities (see table, p. 448). Add their populations together, and compare the result with the ten largest in each of the other groups. (54) Which group of states has the most large cities? Which the least? What reasons can you give?

Suggestions. — (1) Read about the expedition of Lewis and Clark from St. Louis to the Pacific coast in 1803–1806. (2) What is the origin of the expression "to pan out"? (3) Why do the heavier rains on the northern Pacific coast come in winter? (4) Mention several of the advantages and disadvantages of having no rain

for several months at a time, as in southern California. (5) Make a collection of minerals for the school. (6) Hydraulic mining has been largely prohibited in many parts of the West. Why? (7) Should the ditch that is to irrigate a certain field skirt its upper or lower edge? Why? (8) Which is the more easily irrigated, nearly level land, or land that is rough and hilly. Why? (9) Is southern California so liable to cold snaps as Florida? Why? (10) Make a list of articles made of wool. (11) Why have Arizona and New Mexico not become states? (12) Find out about the wild animals in Yellowstone National Park. (13) Write a story describing a visit to southern California. (14) Make a drawing of the Western States.

GENERAL REVIEW QUESTIONS FOR THE UNITED STATES

(1) Name the principal crops of the United States, and tell in which section each is raised (consult the figures, 324 to 336). (2) Do the same for mineral products. (3) For other raw products. (4) For manufactured articles. (5) Name the five largest cities in their order. For what is each important? (6) State some ways in which the rainfall influences the occupations of the people. (7) The temperature. (8) State clearly the influence of the sinking of the coast. (9) Of the glacial period. (10) Of the winds. (11) Of the ocean currents. (12) Of the coal period. (13) Of the absence of forests on the prairies. (14) Of the rich mineral deposits in the West. (15) In what ways have the Great Lakes been of value? (16) Name some of the cities that have been benefited by them. (17) In what ways have the Mississippi River and its two largest tributaries been of value? (18) State the natural advantages that have aided the growth of Boston, New York, Buffalo, Philadelphia, Baltimore, New Orleans, Detroit, Chicago, St. Louis, and San Francisco. (19) Can you name some other cities that have also been influenced by their surroundings? (20) Which is the largest state? (Table, p. 445.) The second in size? The smallest? The next to the smallest? (21) Which state has the largest population? (Table, p. 445.) The second largest? The smallest? Next to the smallest? (22) Draw a map showing the states on the Atlantic coast. Also make a map of those along the Pacific coast; along the Great Lakes; the Mississippi River; the Ohio; the Missouri. (23) What states border Mexico? Canada?

For References, see page 441.

XIII. TERRITORIES AND DEPENDENCIES OF THE UNITED STATES

MAP QUESTIONS: *Alaska.*—(1) Find Alaska on Figure 95. What waters surround it? What country bounds it on the east? (2) On Figure 250, locate Sitka, Circle City, Nome City, and Dawson City. (3) Trace the course of the Yukon. (4) Find the Aleutian Islands. What sea north of them? (5) Find the Pribilof Islands. (6) From Figure 5, tell about the relief of Alaska.

Cuba and Porto Rico. — (Map opposite, p. 330.) (7) Find these islands on Figure 95. (8) Which is the larger? What other large islands near by? (9) What waters bathe their shores? (10) Find Havana, Santiago de Cuba, Matanzas, Ponce, and San Juan.

Hawaiian Islands. — See Figure 270. (11) Name the two largest islands. In what latitude do they lie? (Fig. 360.) (12) On what island is Honolulu? Hilo? (13) How deep is the ocean near these islands?

Guam and Samoa. — See Figure 270. (14) In what latitude is each? (15) What harbor on the island of Tutuila? (16) How deep is the ocean near these islands? (17) Find each on Figure 360.

Philippine Islands. — See Figure 270. (18) Where are these located? (Fig. 360.) (19) Name the two largest islands. (20) What should you expect the climate to be? (21) Find Manila. On which island is it situated?

AT the close of the Revolutionary War the United States consisted of thirteen small colonies along the Atlantic coast from Maine to Georgia. The United States claimed the land far into the wilderness, even to the distant Mississippi. Beyond this was French and Spanish territory, while the whole Mississippi Valley was occupied by Indians. By purchase and by war we have acquired all the land between the Atlantic and the Pacific which


ALASKA
Scale of Miles.
0 100 200 300 400
Cities with over 10,000: Dawson
Cities with 1,000 to 10,000: Sitka
Smaller places: Circle City
Capital: ⊙ Other Places: •
Comparative Area
PENNSYLVANIA
45,215 Square Miles.
ARCTIC OCEAN
BERING SEA
PACIFIC OCEAN
ASIA
SIBERIA
CANADA
International Boundary
Bering Strait
Pt. Barrow
Pt. Hope
East Cape
Gulf of Anadyr
C. Prince of Wales
Nome City
C. Nome
Norton Sd.
ST. LAWRENCE I.
St. Michael
Anvik
Koserefsky
C. Romanzof
ST. MATTHEW I.
NUNIVAK I.
C. Newenham
Bristol Bay
ST. PAUL
PRIBILOF IS.
ST. GEORGE
ALASKA PENINSULA
Sandpoint
ALEUTIAN ISLANDS
Unalaska (Dutch Harbor)
UNALASKA I.
ANDREANOF IS.
RAT ISLANDS
ATTU I.
Romanzof Mts.
Yukon
Nulato
Tanana
Rampart City
Ft. Yukon
Circle City
Eagle City
Dawson
KLONDIKE REGION
Mt. McKinley 20,464
Mt. Wrangell
Mt. Logan
Mt. St. Elias
Gulf of Alaska
Yakutat Bay
Malaspina Glacier
Afognak
Kodiak (St. Paul)
KADIAK IS.
Shelikof Strait
Kuskokwim R.
Lake Clark
CHICHAGOF I.
ALEXANDER ARCHIPELAGO
Sitka
BARANOF I.
PRINCE OF WALES I.
Juneau
Douglas
Skagway
White Pass
Atlin
Dixon Entrance
QUEEN CHARLOTTE IS.
Mackenzie R.
Great Bear Lake
ARCTIC CIRCLE
Pelly R.
Lewes R.
THE M.-N. CO.
Longitude 160° West from 155° Greenwich

FIG. 250.

has been described in the previous pages; but our control does not end with the boundaries of the United States proper. In 1867 we acquired Alaska, and in 1898 we came into possession of a number of islands, some of them on the other side of the globe. Since these lands form a part of the territory controlled by our government, a study of them properly comes at this point.

Alaska

Climate and Physiography. — For a long time Alaska, which is more than twice as large as Texas, belonged to

Fig. 251.

Mt St. Elias, Alaska, 18,100 feet high, and for a long time supposed to be the highest peak on the continent.

Russia. That nation sold the territory to us for $7,200,000; but at the time many people considered it very unwise to pay so large a sum for so distant and desolate a land. However, it has already proved of great value, and has paid for itself many times over.

Since the Arctic Circle extends across the northern

part of Alaska, it will be seen that the climate must be very uninviting. The winters are long and cold, and the summers short and cool. A strip of coast land extends southward from the main peninsula of Alaska, and to this the prevailing westerlies bring an abundance of rain and snow. Since these winds come from the ocean they also render the summer climate much more agreeable than in the northern part of the territory. In this portion is situated SITKA, the capital, where the governor of the territory lives.

A large part of Alaska is mountainous, for the mountains of the United States and western Canada extend northward into this territory. Among these mountains are the loftiest peaks of the continent, the highest yet discovered

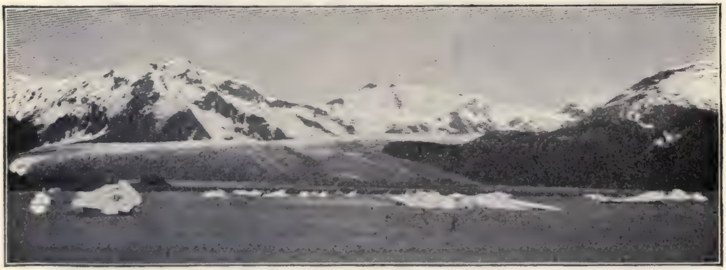


FIG. 252.

Snow-covered Alaskan mountains with a valley glacier descending into the sea.

being Mt. McKinley, which is 20,464 feet high. Owing to the latitude, most of the mountains are snow-covered throughout the year (Fig. 251), and among them are innumerable glaciers, many of which reach down to the sea (Fig. 252).

One of the largest glaciers now on the continent, known as the *Muir Glacier* (Fig. 253), is located in Alaska not far north

of Sitka. It is so wonderful and beautiful that many tourists visit it every year. Taking an excursion steamer from Tacoma or Seattle, they sail much of the way in protected bays and straits behind the mountainous islands which skirt the coast, where the scenery is grand beyond description.

The map (Fig. 250) shows a long peninsula, ending in a chain of islands, the Aleutians, which form the southern boundary

FIG. 253.

Front of the Muir Glacier where it ends in the waters of Muir Inlet.

of Bering Sea. This peninsula and the off-lying islands are really a growing mountain chain; and it was here, in 1795, that a new volcano suddenly broke forth, building a lofty cone where previously ships were able to sail. Altogether there are 57 volcanoes in this chain, which has a length of 1600 miles.

Fishing. — Among the resources of Alaska, as in the case of other far northern lands, those of the sea are especially important (p. 80). In the shallow waters near the coast both cod and halibut abound, while immense numbers of salmon run up the rivers every summer, as they do in northern United States and Canada (pp. 316 and 359). The fishing industry is only partly developed, chiefly because of the great distance from a profitable market;

but the waters of the Alaskan coast form an important fishing reserve for the future.

Whaling. — Every year steamers, specially built for the purpose, venture through Bering Strait into the Arctic Ocean in search of the whale. It is a hazardous occupation, and but few ships are now engaged in it. They are obliged to push their way into the *floe* ice (Fig. 60), in which they are in danger of being imprisoned and held firmly through the winter.

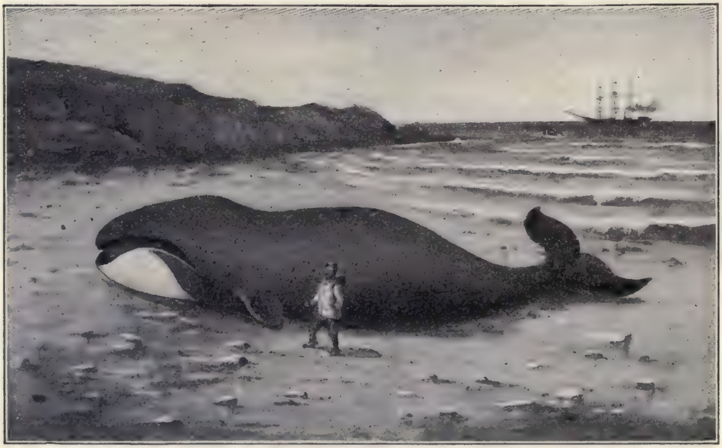


FIG. 254.

A whale ashore, and a whaling steamer lying off in deep water.

The whale, which is sometimes over a hundred feet long, is really a land animal which has taken up life in the sea, as seals and walruses have. Therefore, unlike the true fishes, which secure air from the water by means of gills, the whale must now and then rise to the surface for air. It is when rising to breathe, or "blow," that the huge creature is harpooned.

One species of whale living in the Arctic supplies not only fat, or *blubber*, for oil, but also *whale bone*, a very elastic material which grows in the whale's mouth. Rushing through

the sea with its mouth open, the whale strains the water through the fringes of the whale bone, and thus secures the thousands of tiny animals upon which it feeds. This bone is of use for various purposes, as, for instance, in women's dresses.

Sealing. — In the Arctic are found many different kinds of seal. One of these, the *fur seal*, which lives in Bering Sea, is of great value because of its soft fur, which is much used for winter cloaks. During the greater part of the year the fur seals swim in the sea in search of food; but in the spring, during the breeding season, they resort to the Pribilof Islands. The United States government prohibits all persons from killing them except one company, which pays a special tax for the privilege of securing a certain number each year. At the proper season the men select a number of males, — for a law forbids the taking of the females, — and drive them off for slaughter, much as sheep would be driven (Fig. 256).

FIG. 255.
Fur seals among the rocks near the coast of one of the Pribilof Islands.

While the government permits no other persons to kill the seal on the Pribilof Islands, it possesses no power to protect those found swimming in the sea. Vessels from Canada and the United States, therefore, sail about over the sea, shooting

all they find. Since they kill old and young, male and female, and wound many that afterward die, they are rapidly destroying the fur seal, and threaten to exterminate it entirely.

Fig. 256.
Driving off a bunch of fur seals for slaughter.

Mining. — While there is some opportunity for farming in southern Alaska, and the great tracts of forest land may be the seat of an important lumbering industry in the future, at present the most noted industry of Alaska is gold mining. There are extensive deposits of gold, copper, coal, and other minerals; but they are so difficult to reach that there has been little development of any of these except the first. A short distance north of Sitka, at Juneau (Fig. 257), there are some very paying gold

Fig. 257.
Juneau, nestled at the base of the mountains near some valuable gold mines.

mines; and elsewhere in the territory gold mining is also carried on.

Recently, Alaska and the neighboring Klondike region, just across the line in Canada, have attracted attention because of the discovery of rich deposits of gold-bearing gravels, somewhat like those found in California in 1848. Although a bleak, desolate region, far in the interior and difficult of access, men have rushed there, as years ago they

FIG. 258.
Miners, with their loads of supplies, at Chilcoot Pass, on the way to the Klondike.

hurried to California. Some have gone overland across the mountain passes (Figs. 258 and 259); others have travelled an easier route by water, taking a steamer to the mouth of the Yukon River, one of the longest rivers on the continent. There they transferred to river boats; but since the Yukon is frozen over during most of the year, this journey can be made only in summer.

In the scramble for gold many persons have endured terrible hardships. Most have returned with little of the precious

metal, but some have brought back fortunes. Good-sized towns have grown up as a result of the inrush of people, the largest being Dawson City, Canada, and Circle City in Alaska, just south of the Arctic Circle. Another city that grew in a single season is Nome City.

These hardy pioneers are opening up a country which, though naturally unattractive, is probably destined to become one of the great mineral-producing regions of the world. Most parts

Fig. 259.

Miners fording the icy waters of an Alaskan river, on the way to the Klondike. Two of them are harnessed to a wagon containing their supplies.

of the Arctic lands must always be sparsely populated; but rich deposits of precious metal will always suffice to attract large numbers of men.

Cuba and Porto Rico

While the United States has within recent years secured possession of bleak northern lands, it has still more recently come into control of some warm tropical islands. As a result of the war of 1898, Porto Rico was ceded to


CUBA,
PORTO RICO
and
JAMAICA,
WITH GENERAL MAP OF
THE WEST INDIES.
Cities with over 200,000 : . . . Havana
Cities 50,000 to 200,000 : . . . . Matanzas
Cities 25,000 to 50,000 : . . . . . . Kingston
Smaller places : . . . . Guantanamo
Capitals : . . . Other Cities : . . .
Longitude West from Greenwich
Pennsylvania, Comparative Area
45,215 Square Miles.
Gulf of Mexico
ATLANTIC OCEAN
CARIBBEAN SEA
Havana
(La Habana)
Matanzas
Florida Strait
Nicholas Channel
Santarem Channel
Old Bahama Channel
SALT CAY BANK
PINAR DEL RIO
LA HABANA
MATANZAS
SANTA CLARA
PUERTO PRINCIPE
SANTIAGO DE CUBA
ISLA DE PINOS
Nueva Gerona
CAYO LARGO
C.San Antonio
Cienfuegos
Trinidad
Sancti Spiritus
Puerto Principe
Victoria de las Tunas
Gibara
Holguin
Manzanillo
Baracoa
Cape Maisi
Windward Passage
Guantanamo B.
Santiago de Cuba
Surrendered to U.S., July 17, 1898
Spanish Squadron destroyed by U.S. Navy, July 3, 1898
Gulf of Guacanabo
Cape Cruz
QUEEN'S GARDENS
PORTO RICO
Same Scale as main Map.
San Juan
Ponce
Mona Passage
VIRGIN ISLANDS
ST. CROIX I. (Dan.)
JAMAICA
(British)
Montego Bay
Kingston
Spanish Town
Port Antonio
Scale of Miles.
GENERAL MAP OF THE
WEST INDIES.
Scale of Miles.
BAHAMA ISLANDS
GREATER ANTILLES
LESSER ANTILLES
CENTRAL AMERICA
SOUTH AMERICA
PROPOSED NICARAGUA CANAL
Port au Prince
Caracas
Port of Spain
THE M. N. CO.

FIG. 260.

the United States, and Cuba was given its independence, under the general guidance of the United States.

Physiography and Climate. — Among the West Indies the largest island is Cuba, which is nearly as large as Pennsylvania, although much longer and narrower. The next in size is Haiti, and of the others the only two of much importance are Jamaica and Porto Rico, the latter being three-fourths the size of Connecticut. Cuba, Haiti, and Porto Rico form a portion of a single mountain chain, highest in Haiti, though reaching an elevation of 8600 feet in Cuba.

While there are tree-covered mountain ranges in each of the islands, a large portion of Cuba and Porto Rico has been cleared and cultivated. This is especially true of Porto Rico, which is really an island of farms. Crops grow luxuriantly, partly because of the excellent soil, formed by the decay of the rocks, and partly because of the favorable climate.

The islands are entirely within the tropical zone, so that their temperature throughout the year is high, and on the lowlands neither snow nor frost are known. They lie in the trade wind belt (Fig. 42) and therefore receive an abundance of rain, especially upon the northeastern or *windward* slopes, which the damp air from the ocean first reaches. The summer is the rainiest season, for then the winds blow with greater strength and steadiness.

Forests and Minerals. —When first settled, the West Indies were covered by a dense tropical forest. Much of this has been cleared away for purposes of farming; but some of the woods still remain, especially among the higher mountains. In Cuba, for instance, there is still much valuable timber, such as mahogany, ebony, and fustic, which produces a valuable yellow dye.

Besides these raw products of the soil, there is considerable mineral wealth in Cuba. Copper is found there, and also iron, the latter having been mined for a long time in the neighborhood of SANTIAGO.

Agriculture. — However, it is agriculture that forms the chief industry of the Cubans and Porto Ricans. As in all the West Indies, the principal crop is sugar-cane (Fig. 317), which grows well in the rich soil and the warm, rainy climate. Although much sugar is raised, the indus-

FIG. 261.
A Cuban ox team.

try has not proved very profitable because of the primitive methods employed and the absence of a good market. Now that the United States controls these islands great improvement should take place.

Sugar production is carried on in Cuba much as it is in Louisiana (p. 213). After the cane is cut, the sap is extracted and reduced to brown sugar in sugar houses, and then sent away to be manufactured into white sugar. Two of the products of the sugar plantations are molasses, and rum, which is made of molasses.

A second important crop is tobacco, for which Cuba is especially noted. There is one district, on the western end of the island, where the rich, limey soil and the climate are peculiarly suited to the growth of the best quality of tobacco. At HAVANA and other places it is manufactured into cigars, which bring high prices — the Havana cigar being considered the best that is made. What has been said about Key West in Florida?

Upon the hillslopes much coffee is produced, and some tea and cocoa. The coffee plant not only requires a good soil, but must be grown in the shade of trees. Spices, including nutmeg, cinnamon, and ginger, are products of the West Indies, also pepper, cardamom, vanilla, and pimento or allspice. Such fruits as bananas, oranges, limes, pineapples, and cocoanuts are also produced; but, because of the poor market, in small quantities. In the future much more attention will doubtless be paid to fruit raising. Indeed, both Cuba and Porto Rico will probably become not only winter gardens, supplying fruit and vegetables to the United States, but also important winter resorts.

FIG. 262.
A Cuban boat.

The United States has been able to raise almost all products of the soil that we have required, with the exception of the tropical and semi-tropical crops, such as tea, rice, coffee, sugar, spices, and tropical fruits; and our newly acquired islands are capable of supplying even these.

The Inhabitants. — Portions of Cuba and Porto Rico are densely populated, although in Cuba's war with Spain

thousands upon thousands of the inhabitants were killed in battle or starved to death. Property had been destroyed, and the island devastated to such an extent that it will be many years before a full tide of prosperity returns.

Many of the natives are of mixed blood. The aborigines did not prove good slaves to their Spanish conquerors, and negro slaves were brought from Africa. Therefore, while pure-blooded Spaniards are numerous, many of the

FIG. 263.
The harbor of Havana.

inhabitants of Cuba and Porto Rico are negroes, either full blooded or half-breeds. The Spanish have kept these natives very poor and densely ignorant; but they are capable of advancement under proper guidance, and this, it is hoped, they will receive from the United States.

Cities. — Owing largely to an entire lack of coal and to the policy of the Spaniards, there has been very little manufacturing; but nevertheless there are several important cities, principally along the coast, at points where there are remarkably fine harbors. The largest of these is

HAVANA in Cuba, a city of 200,000 inhabitants, and for a long time the centre of the Spanish dominion in America. Another large city in Cuba is SANTIAGO DE CUBA, where the Spanish ships were sunk in 1898 (see map, Fig. 260). A third important city, with an excellent harbor, is MATANZAS.

Railway lines connect some of these cities and also reach out into the agricultural districts, thus serving to bring

FIG. 264.
A street in San Juan.

the crops to these points for shipment. However, many of the towns are not connected by rail; and since there are few good wagon roads, they have almost no communication with the outside world, excepting by boat.

The conditions in Porto Rico are nearly the same as in Cuba, though it is less wooded than Cuba and more completely cultivated. Along the lower sections, near the coast, sugar and tobacco are raised; the low mountains produce excellent coffee, one of the most important

products of the island; and the slopes between are largely occupied by herds of cattle. As in Cuba, there are a number of coastal cities, the largest being PONCE and SAN JUAN (Fig. 264), the capital.

THE HAWAIIAN ISLANDS (Fig. 270)

The Volcanoes. — Far out in the mid-Pacific, not quite a third of the distance from the Pacific coast to the Philippine Islands, is a mountain chain fifteen hundred miles long, most of which lies beneath the ocean. From this

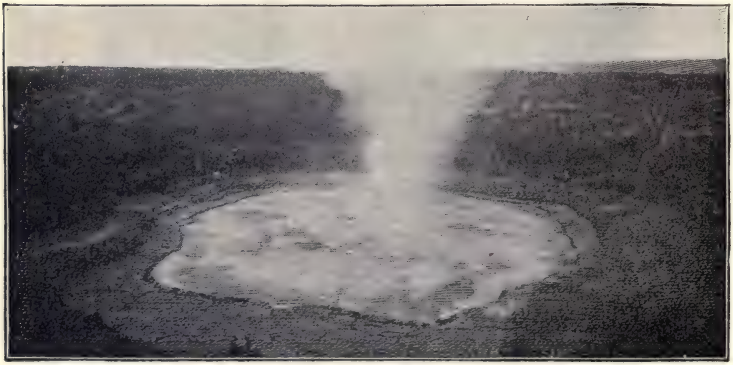


FIG. 265.

Lake of liquid lava in one of the craters of the Hawaiian volcanoes.

long, submarine ridge there rise several volcanic peaks, forming a chain of islands, known as the Sandwich or Hawaiian Islands. The largest is Hawaii, which is nearly as large as Connecticut.

Each of the islands is composed chiefly of lava which has been erupted from within the earth. Two of the large Hawaiian volcanoes are still active, the largest, Mauna

Loa, extending nearly fourteen thousand feet above the sea. From the coast the sea bottom descends so rapidly that, within a few miles of the shore, a depth of eighteen thousand feet is found. Therefore, if the water should be removed, a mountain peak would be revealed rising nearly thirty-two thousand feet above its base — a loftier mountain than any known on the land.

FIG. 266.

A lava cascade, where the melted rock has cooled as it fell over the edge of a low cliff.

Climate. — The latitude of the Hawaiian Islands is about the same as that of Cuba and Porto Rico. Being in the midst of the broad Pacific, and therefore surrounded by warm ocean water, the climate near sea level is warm and wonderfully equable. From day to night, and even from summer to winter, the thermometer varies only a few degrees. As in the West Indies, the trade winds blow steadily and bring an abundance of rain to the windward northeastern slopes. The opposite or *leeward* slopes are very much drier, and in places even arid.

Island Life. — When these islands were first visited by white men, they were inhabited by a strange, dark-skinned race of savages. A luxuriant vegetation covered the land, and there were a number of native animals, though none of these were of great size, the largest being birds, bats, mice, and lizards. It

is an interesting question to ask how men, plants, and animals ever reached these islands which are 2700 miles from America, and more than 5000 miles from Asia.

It is now known that the seeds of plants, and even birds and insects, are drifted to the ocean islands by means of winds. On the Bermuda Islands, for instance, which lie 600 miles east of the Carolina coast, the plants and animals are like those of the neighboring mainland. Every year robins, sparrows, and sometimes even tiny humming-birds, alight there for a rest after the long and perilous journey which they have been forced to undertake because of the strong winds which have driven them out to sea.

Birds, insects, and seeds may be carried not only by the wind, but also by the ocean currents, in which they float, clinging to logs until they are perhaps stranded on the shores of some ocean island. It is in this way that the islands have become inhabited by plants and animals; but large animals, not being able to travel long distances in this manner, are rarely found on ocean islands far from the continents.

FIG. 267.
Building a grass hut in the Hawaiian Islands.

It is probable that men have reached these islands in much the same way. Venturing out too far in their canoes, or driven from shore by the winds, they have been carried on and on until they have reached strange lands which they were obliged to accept as their homes. In this manner, it is believed, people from southern Asia and the East Indies, have spread eastward to the Philippine Islands, to the small islands that dot the Pacific, and even so far away as the Hawaiian Islands.

Industries. — The Hawaiian Islanders are an intelligent race, resembling the natives of other Pacific islands. Since white men brought in new methods of agriculture, the larger islands have become fairly productive, the principal crop being sugar. Coffee, tropical fruits, and rice (Fig. 268) are other products, the last being cultivated by the Chinese, who make up a large part of the foreign population. There are also many Japanese, Portuguese, and Americans. The chief market has been the United States, especially San Francisco. In fact these islands formed one of the principal sources of food supply for the early Californian miners.

FIG. 268.
Planting rice in the Hawaiian Islands.

The white men's interests in the Hawaiian Islands led to a revolution some years ago, by which these men took control of affairs from the native queen, set up an independent government, and offered themselves to the United States as a territory. After some delay this offer was accepted.

While many of the inhabitants are engaged in agriculture, large numbers are gathered in small villages along the seacoast. There are only two cities, HONOLULU (Fig. 269), on the island of Oahu, and HILO, on Hawaii.

The Hawaiian Islands as a Coaling Station. — During the war with Spain the Hawaiian Islands were of importance to the

United States as a coaling station for ships bound to the Philippine Islands. The distance from San Francisco to the Philippines is somewhat more than seven thousand miles. If we wish to send a warship there from the Pacific coast, it is quite necessary that it should find a place on the way at which it could obtain coal. Such a ship might carry perhaps eight hundred tons of coal; but as it may burn from sixty to seventy tons a day, this would last less than two weeks, while the journey across would require more than three weeks. Therefore the government needs a place where it can store large

FIG. 269.

The harbor of Honolulu.

quantities of coal, perhaps as much as from ten to twenty-five thousand tons, to be used in case of need. All large naval powers need coaling stations in various parts of the ocean. Great Britain, the greatest power upon the sea, has them scattered all over the world.

GUAM AND SAMOA

For a number of years the United States, Germany, and England had control over the Samoan Islands (Fig. 270); but this arrangement did not prove satisfactory, and now Tutuila, one of the islands, is owned by the United States. This tiny island is of little value to us excepting as a coaling station

UNITED STATES' DEPENDENCIES IN THE PACIFIC.

FIG. 270.

at the harbor of Pago Pago (Fig. 270). The natives are of the same race as those of the other islands of the open Pacific. They are splendidly developed physically, and manage a boat and swim so well that they are almost as much at home in the water as on land. The principal products are cocoanuts and cotton, and the chief city is Apia, on Upolu, which belongs to Germany.

In consequence of the war with Spain, we obtained the island of Guam, one of the Ladrones or Robbers' Islands, some distance east of the Philippines. These islands, the loftiest peaks of a submarine mountain chain, were first seen by Magellan, who was later killed by the natives of the Philippines. Guam, the largest of the Ladrones, reaches an elevation of from fifteen to eighteen hundred feet above the sea; but it is so small, and so far away, that it also is of little service to us except as a coaling station for vessels.

The Philippine Islands

PURCHASED FROM SPAIN IN 1898 FOR $20,000,000

Physiography. — This group of islands, or *archipelago*, consists of several thousand separate islands, many of which are very small. The largest, Luzon, is about the size of Kentucky, and the second, Mindanao, is almost as large. Like the West Indies and the Hawaiian Islands, the Philippines are portions of mountain chains in the sea. They form part of a still greater chain, reaching northward to the Japanese Islands and beyond.

Throughout the archipelago earthquakes are common and sometimes very destructive to property and to life; for instance, the earthquake of 1863 destroyed a large part of Manila. The earth is in an almost constant state of tremor, though most of the shocks are so slight that they are detected only by the aid of delicate instruments. In addition to earthquakes, there have at times been destructive volcanic eruptions. Some of the volcanic cones of the Philippines reach to a height of 8000 to 10,000 feet.

While parts of the islands are mountainous and still covered by forests, there are many valleys that have been cleared for farming. In these the soil is usually deep and fertile, being formed by the decay of lavas, limestones, and other rocks rich in plant food.

Since none of the islands are very large, there can of course be no great rivers; but many of them are so deep near their

FIG. 271.

Philippine boats, really logs with the centre dug out.

mouths that small steamboats are able to navigate the lower portions of all of the larger streams. Near the volcanoes there are lakes formed by the lava damming up the streams.

Climate. — Besides earthquakes and volcanoes, the Philippines are visited by those terrific tropical storms known as *hurricanes* in the West Indies, and *typhoons* in the East Indies. These storms resemble the cyclonic storms of the Northern States (p. 53), excepting that they are many times more violent. Commencing in the heated belt near the equator, they develop intense energy,

and move slowly off into the temperate latitudes. They are accompanied by a terrific downpour of rain and by winds so violent that houses are torn to pieces, and trees dragged out by their roots. During these storms much property is destroyed, and many lives are often lost.

As in the West Indies, the climate of the Philippines is that of the tropics — always warm, and sometimes very hot, especially at a distance from the sea. They have a heavy rainfall, the year being divided into the dry and rainy seasons. The former comes during the winter months, the latter in the summer. The dry period lasts while the trade winds blow from the northeast, and then

Fig. 272.

Philippine natives and the domesticated buffalo.

the fields often become parched and cracked, and the roads very dusty. In the summer, however, the winds change to the southeast, forming a part of the great summer monsoon of Asia (p. 40). These winds, blowing from the warm, humid equatorial belt, deluge the islands with rain to such an extent that much of the country becomes

a swamp, and travel is almost impossible. The showers are local; and while a heavy downpour occurs in one place, there may be no rain a short distance away on the leeward slopes.

The natives have domesticated a native wild animal, the water buffalo (Fig. 272), which is so accustomed to the mud that it can be driven about during the wet season. This draft animal is of great use, especially in the rice fields, which are kept wet during the growing season. The buffalo prefers wet walking to dry, and, in fact, must have a daily plunge in the mud and water.

Because of this damp climate, the Philippine houses are so built that the lower story is used for storage, as a cellar is in our country. This raises the inhabited part of the house above the damp ground.

Resources and Industries. — Owing to the tropical warmth and dampness and to the excellent soil, the uncultivated parts of the islands are covered with a dense tropical forest, containing many valuable woods. As in other tropical forests, there are immense numbers of animals, especially insects, serpents, and beautiful birds. Among the serpents are the huge python and the deadly cobra di capello. There are also deer, apes, wild hogs, wild buffalo, huge bats, and man-eating crocodiles.

The inhabitants of the Philippines number from eight to ten millions, about one-half of whom are civilized; but there are still many savages on some of the islands, especially in the dense forests. Two very different races occupy the islands, — the aborigines and the *Malays*. The former, a race of small, dark-skinned savages, are called *Negritos*, a Spanish word meaning little negroes. They have been gradually forced to retreat to the forests by

the more powerful and intelligent Malays. Besides the Negritos, the various tribes of Malays, and the half-breeds, many Chinese traders and Spaniards live on the islands.

Under the influence of the Spaniards, the more civilized tribes, whom Magellan found in a savage state, have cleared the land and have reached a fairly high grade of civilization. Their wants are few, and very little work suffices to keep them supplied with what they need. Cocoanuts and bananas are easily obtained, and rice, yams, and other plant foods may be

FIG. 273.

Philippine boys making cigars.

raised with very little effort. There is, therefore, no special reason for working hard; and, in fact, in that climate hard work is almost impossible.

The riches of the forest are scarcely utilized at all. Among the valuable woods are ebony, the rubber tree from which gutta percha is obtained, and a palm from the sap of which alcohol may be made. Cinnamon, cloves, and pepper also grow there.

The mineral resources appear to be extensive, although almost entirely undeveloped, since the Spaniards never encouraged mining there. Gold is known to exist in Luzon, and silver, coal, petroleum, marble, and sulphur also occur.

Aside from plant products consumed at home, some cocoa, coffee, sugar, and tobacco are raised for export, the latter being manufactured into cigars at MANILA (Fig. 273). This is almost the sole manufacturing of importance, and the inhabitants depend upon Europe and America for all but the very simplest materials, which they themselves produce.

Hemp is the best-known export of these islands, which supply the world with the fibre used in making the better grades of Manila rope. Hemp is made from the fibre of a wild plantain, which so closely resembles the banana that an inexperienced person cannot easily tell the two apart. In order to obtain the fibre, the plant is cut and allowed to wilt for a short time, then drawn between a block of wood and a knife, in order to scrape the pulp away. The fibre is spread for several hours in the sun to dry, and then pressed into bales for shipping. Since the work is crudely done by natives, without the aid of machinery, about 40 per cent of the fibre is wasted.

The castor bean grows wild on many of the islands, and its oil is extracted for many local purposes. Cocoanut palms also flourish, and great rafts of cocoanuts are shipped down the rivers to the sea. From this nut an oil is made that is used in lamps and sometimes in the manufacture of a substitute for lard. Much of the dried meat of the nut is shipped to Europe to be used in soap making.

One of the most remarkable plants of the island is the rattan, which is put by the natives to a thousand uses, such as making ropes, houses, canoes, frames, carts, beds, and chairs. Many of the natives make a living by splitting and marketing the cane. The bamboo is also of great value, being considered indispensable by the natives (Fig. 274). This plant grows from one inch to eighteen inches in diameter, and from five to seventy feet in

height. It is used in making the frames, sides, and even the roofs of houses, and also rafts, boats, agricultural implements, bows, bowstrings, arrows, spoons, forks, and many other articles.

Under the Spanish rule the people of the Philippines were greatly oppressed, and the industries only partly developed. Large portions of the islands were left in a wild state; and even in the best-settled regions little attempt was made to develop the resources. The islands are able to produce not only quantities of sugar, rice, tobacco, coffee, and cocoa, but also much more hemp than at present. What has been said about the valuable forest and mineral products?

Fig. 274.

A Philippine lumber yard, where bamboo is the lumber. Compare this with Figures 105 and 223.

There is a promising future in the proper development of all the resources of these islands, and the civilized natives are able to help in the work. Many of them are educated and cultivated, living in excellent homes and surrounded by luxuries. In religion, most of the inhabitants belong to the Roman Catholic faith, which was introduced in their early settlement by the Spaniards. However, the natives of the Sulu Islands, called *Moros*, are Mohammedans. These Moros are ruled by a Sultan under the general guidance of the United States.

Cities. — In the Philippine group there are many cities having a population of more than ten thousand, and a number have as many inhabitants as Gloucester, Mass., Jacksonville, Fla., or Butte, Mont. However, there is at present only one city of great importance in the archipelago, namely, MANILA, on the island of Luzon, a city nearly as large as St. Paul. It is situated upon an excellent harbor, and was for a long time the centre of the Spanish government in the Philippines.

REVIEW QUESTIONS AND SUGGESTIONS

QUESTIONS: *Alaska.* — (1) From whom was Alaska obtained? How? (2) Describe the climate. (3) Name and locate the capital. (4) What are the surface features? (5) Describe the Muir Glacier. (6) Tell about the volcanoes. (7) What kinds of fish are found? (8) Describe whaling. What valuable products are obtained? (9) Tell about the seals: — where found; habits; efforts to protect them; method of killing; their value. (10) Describe mining in Alaska: — minerals found; location of the gold mines; cities that have grown up; the rush of gold seekers; the change that they have brought about.

SUGGESTIONS. — (11) Collect some whale bone. (12) Collect pictures of Alaska. (13) Find out what people thought when the purchase of Alaska was being considered. (14) Try to find some one who has been in Alaska, and have him tell you about the country. (15) How does the area of Alaska compare with that of the United States proper? With your own state? (See tables, pp. 445 and 447.) (16) Measure the length of the Yukon and compare it with the Mackenzie and the Mississippi. (17) Draw an outline map of Alaska.

QUESTIONS: *Cuba and Porto Rico.* — (18) Name the principal islands of the West Indies. (19) Tell about their relief. Their climate. (20) What is the reason for the heavy rains of summer? (21) What about the forests and their peculiar products? The minerals? (22) Name the principal farm products, and tell about each. (23) Tell about the inhabitants. (24) Why so little manufacturing? (25) Name and locate the chief cities in Cuba and Porto Rico.

SUGGESTIONS. — (26) Estimate the length and the average breadth of Cuba. (27) How do its two leading cities compare in size with

the two largest in Pennsylvania? (Table, p. 448.) (28) What products of Cuba and Porto Rico are also raised in the United States? Where? (29) State some advantage that Cuba enjoys over Louisiana in the production of sugar. (30) In what respects are the inhabitants similar to those of Mexico? (31) How is our control of these islands liable to prove of benefit to us? To the islands themselves? (32) Make a sketch map of Cuba and Porto Rico.

QUESTIONS: *The Hawaiian Islands.* — (33) Where are the islands? (34) How have they been formed? (35) Tell about the volcanoes. (36) About the climate. (37) How have they probably become inhabited by plants, animals, and men? (38) Name the leading products. (39) The principal cities. (40) How did the islands come into our possession? (41) Of what use are they to us?

SUGGESTIONS. — (42) Why should you expect much the same products in the Hawaiian Islands as in Cuba? (43) Why is not the summer very hot in this tropical region? (44) What city on the Eastern coast should be associated with San Francisco as important for refining sugar? (45) Explain the presence of many Chinese and Japanese in these islands.

QUESTIONS: *The Philippine Islands.* — (46) Name the two largest islands. (47) How have the islands been formed? (48) Tell about the earthquakes. The soil. The rivers. (49) About the hurricanes, and the dry and rainy seasons. (50) What about Philippine houses? Draft animals? (51) Tell about the forests and wild animals. (52) About the native inhabitants. (53) About the farm products. (54) About the manufacturing. (55) What are the future prospects of the islands? (56) Locate the principal city.

SUGGESTIONS. — (57) Compare the latitude of the islands with that of the West Indies and of the Hawaiian Islands. (58) In what other places thus far studied have volcanoes abounded? (59) Collect pictures of scenes in the Philippines. (60) Obtain a piece of Manila hemp rope for the school collection; also a piece of bamboo and of rattan. (61) Tell about Dewey's capture of Manila. (62) Make a sketch map of the islands.

GENERAL QUESTIONS. — (63) Name the dependencies of the United States. (64) Walk toward each. (65) Name the principal products of each. (66) In what zones do they lie? (67) How did we obtain each?

For REFERENCES, see pages 441–442.


DOMINION OF CANADA
AND NEWFOUNDLAND
Scale of Miles.
0 100 200 300 400 500 600
Cities with over 500,000:........New York
Cities with over 200,000:..........Montreal
Cities with 50,000 to 200,000:......Hamilton
Cities with 25,000 to 50,000:........Winnipeg
Smaller places:...................Port Arthur
Capitals with less than 25,000:.........Regina
Capitals of Countries : Capitals of Provinces : Other Cities :
Longitude
160° 150° 140° 130° 120° 110° 100°
120° 110° 100°
60° 50° 40°
Beaufort Sea
Mackenzie Bay
Mc Clure Strait
MELVILLE I.
BANKS LAND
Melville Sound
Prince of Wales Strait
C. Bathurst
PRINCE ALBERT LAND
WOLLASTON LAND
PRINCE OF WALES I.
McClintock Channel
BATHURST I.
Barrow Strait
Coronation Gulf
Dease Strait
Bathurst Inlet
KING WILLIAM LAND
BOOTHIA FELIX
ALASKA
Mt. McKinley
Yukon R.
Circle City
Eagle City
Alaskan Mts.
Cook Inlet
Porcupine R.
Ft. McPherson
KLONDIKE
Dawson
REGION
YUKON
Mt. St. Elias 18,024
Mt. Logan
Malaspina Glacier
Muir Glacier
Chilcoot Pass
White Pass
L. Lebarge
Lake Teslin
Skagway
Juneau
Sitka
Ft. Wrangel
PRINCE OF WALES
Dixon Entrance
QUEEN CHARLOTTE ISLANDS
Hecate Strait
Queen Charlotte Sound
VANCOUVER ISLAND
Strait of Juan de Fuca
Nanaimo
Victoria
New Westminster
Seattle
Puget Sound
Tacoma
Portland
Columbia
C. Blanco
San Francisco
PACIFIC OCEAN
Sylvester
Cache
Fort Norman
Mackenzie R.
Great Bear Lake
MACKENZIE
L. la Martre
Great Fish or Back R.
Garry
L. Doobaunt
ARCTIC CIRCLE
Mountain R.
Ste. Anne
Great Slave Lake
Great Slave R.
Telzoa R.
Fort Nelson
Laird R.
Fort St. John
Fort Chippewyan
Peace R.
Lake Athabasca
ATHABASCA
Athabasca R.
Lesser Slave L.
Reindeer Lake
DOMINION
BRITISH COLUMBIA
ROCKY MOUNTAINS
Quesnel L.
Revelstoke
Rossland
Nelson
Edmonton
ALBERTA
Mt. Hooker
Banff
Calgary
Medicine Hat
McLeod
Battleford
Prince Albert
SASKATCHEWAN
Saskatchewan R.
Lake Winnipegosis
Lake Winnipeg
ASSINIBOIA
Moose Jaw
Regina
MANITOBA
Lake Manitoba
Brandon
Winnipeg
Rat Portage
Lake of the Woods
KEEWATIN
Chesterfield Inlet
C. Eskimo
Ft. Churchill
Churchill R.
Nelson R.
York
L. Seul
Helena
Missouri R.
Red R.
UNITED STATES
Duluth
Minneapolis
St. Paul
Mississippi R.


GREENLAND
(To Denmark)
The Interior is entirely covered with Ice, possibly 2,000 ft. to 3,000 ft. thick.
KING FREDERICK VI. LAND
Denmark Strait
C.Dan
C.Farewell
Julianehaab
Godthaab
C.York
Jones Sd.
NORTH DEVON
Lancaster Strait
BYLOT I.
BAFFIN BAY
Upernivik
DISKO I.
Godhavn
Disko Bay
COCKBURN ISLAND
Home Bay
BAFFIN LAND
DAVIS STRAIT
C.Walsingham
CUMBERLAND PEN.
C.Mercy
Cumberland Sound
HALL PENINSULA
Frobisher Bay
RESOLUTION I.
MELVILLE PENINSULA
Fox Channel
FOX LAND
SOUTHAMPTON ISLAND
Fisher Strait
Hudson Strait
C.Chidley
MANSFIELD
Mosquito Bay
Payne L.
Ungava Bay
LABRADOR
Nain (Mission)
Hopedale (Mission)
Hamilton Inlet
UNGAVA
CANADA
C.Dufferin
HUDSON BAY
Richmond Gulf
Great Whale R.
Big R.
LABRADOR PENINSULA
Hamilton R.
C.Henrietta Maria
James Bay
East Main R.
Height of Land
QUEBEC
L.Mistassini
ANTICOSTI I.
C.Bauld
NEWFOUNDLAND
St.John's
Cape Race
Gulf of St. Lawrence
GRAND MIQUELON (To France)
ST. PIERRE I. (To France)
Banks of Newfoundland
PR. EDWARD ISLAND
Charlottetown
CAPE BRETON I.
Strait of Canso
SABLE I.
NEW BRUNSWICK
Moncton
NOVA SCOTIA
Halifax
C.Sable
Yarmouth
Bay of Fundy
Fredericton
St.John
Sherbrooke
Quebec
L. St.John
Montreal
R. St. Lawrence
Hull
Ottawa
Peterboro
Kingston
L. Nepigon
ONTARIO
Port Arthur
Ft. William
Lake Superior
Sault Ste. Marie
Lake Huron
Lake Michigan
Toronto
Guelph
Hamilton
London
L. Ontario
Niagara Falls
Buffalo
Brantford
Welland Canal
Lake Erie
Detroit
Windsor
Milwaukee
Chicago
Portland
Cape Cod
Boston
New York
ATLANTIC OCEAN
Comparative Area.
PENNSYLVANIA.
45,215 Square Miles.
90° from Greenwich
THE M.-N. CO.

FIG. 275.

Part III

OTHER COUNTRIES OF NORTH AMERICA

XIV. COUNTRIES NORTH OF THE UNITED STATES

Map Questions. — (1) Trace the boundary between United States and Canada. Which part of it is natural boundary? (2) Which states border on Canada? (3) Why are there so many lakes in the Dominion? (4) Name the seven largest (including the Great Lakes). (5) Name the five largest rivers; tell in which direction each flows and where it empties. (6) Where are the large cities? (7) What are the names of the largest? (8) Can you see any reasons for their location? (9) Trace the Arctic Circle across Canada. (10) Compare the latitude of Labrador with that of England (Fig. 360). Why are there so few inhabitants in the former? (See p. 71.) (11) Draw an outline map of Canada, inserting the important rivers, lakes, and cities.

Canada and Newfoundland

As we have learned, the northwestern extremity of North America is in possession of the United States; but almost all of the remaining land north of our country belongs to Canada.

History. — While the British were founding the thirteen colonies, the French occupied the coast of eastern Canada and made settlements along the St. Lawrence valley, as at

Quebec and Montreal. Even now four out of every five persons in the Province of Quebec speak French as their mother-tongue. The French and English were often at war; but finally England, aided by her colonies, acquired control of all the French possessions north of the United States, except the small islands of Miquelon and St. Pierre, which are still retained by the French as fishing stations.

After the Revolutionary War, Canada still remained in the possession of Great Britain. There were at first several colonies, or *provinces*, with separate governments, though all were under the control of Great Britain; but in 1867 a union was formed called the DOMINION OF CANADA. Each of the seven provinces — Nova Scotia, Prince Edward Island, New Brunswick, Quebec, Ontario, Manitoba, and British Columbia — now has a government of its own, as our states have; but by their union they also have a central government with the capital at OTTAWA, which corresponds to our capital at Washington.

Besides these provinces, there are four organized territories: Assiniboia, Saskatchewan, Alberta, and Athabasca; and also a number of unorganized territories, or territories without a regularly organized government. Most of the latter are practically a wilderness and of little importance at present. Their names will be found on the map (Fig. 275).

Newfoundland has refused to join this federation, so that, while still a province of Great Britain, it has no connection with Canada. Under the government of Newfoundland is included, not only the island, but also the east coast of Labrador.

As in the case of the United States, the early settlements in Canada were made in the east, though westward migration has now opened up not merely the interior, but even the mountainous western part. At present, the population is over five million, more than one-fourth of whom are French.

Physiography and Climate. — The climate of southern Canada is similar to that of northern United States, though of course slightly cooler. Its physiography is nearly the same also; and since the glacier, which spread over northeastern United States, had its origin in Canada, the effects are found there, as here. Lakes, falls, and rapids abound, and the soil is made of glacial drift.

The surface of eastern Canada is much like the surface of New England; and, as in New England, there is much beautiful scenery. One of the most noted regions on the continent is the Saguenay River, a tributary of the St. Lawrence, which enters that river below Quebec. It occupies a deep valley bounded by cliffs, which in places reach from a thousand to eighteen hundred feet above the water, some of them rising almost vertically. In places, too, the water is from six to eight hundred feet deep; and the scenery resembles that of the fjords of Norway. Indeed, it is of the same origin, being a river valley partly drowned by the sinking of the land, as in the case of the Hudson. The scenery is so wonderful that many tourists visit the Saguenay each year.

Fig. 276.

A view along the line of the Canadian Pacific Railway in British Columbia.

That section of Canada which lies north of Ohio and New York is more level, like those states, and it is the most important farming region in the Dominion. Farther west, north of Dakota and Montana, are broad plains (Fig. 288), arid in the western part, and increasing in elevation to the very base of the Rocky Mountains. After crossing these plains, the Canadian Pacific Railway, which extends from the Atlantic to the Pacific coast, follows the valleys among the mountains, and climbs to the passes amidst canyons, glaciers, and snow-capped peaks (Figs. 276–278). Name the mountains (Fig. 275). The scenery of this region is wonderfully beautiful and interesting, and the railway passes through the midst of it. A portion of this wonderland has been set aside as a national park by the Canadian government.

FIG. 277.

A view among the mountains of British Columbia, through which the Canadian Pacific passes.

The headwaters of the Yukon River, mentioned under Alaska (p. 329), are in Canada; and farther east than this is the Mackenzie River, one of the largest on the continent. It is 2000 miles long. What three large lakes drain into the Mackenzie? Why is that river of little use for navigation? What other large Canadian rivers drain into northern waters?

How would they be more useful if they drained southward, as the Mississippi does?

Canada shares with the United States the privileges of navigation on all the Great Lakes, with one exception. Which is it? In addition to these great waterways, the lower St. Lawrence is entirely in Canada; but on account of the severe winters this is not so great an advantage as might at first appear. Why?

There are numerous rapids in the St. Lawrence, over which vessels cannot pass; but large ship canals have been built around these. Now, therefore, all but the large ocean steamers are able to go from the open ocean to the western part of Lake Superior, a distance of twenty-four hundred miles. In this respect the Canadian route has a great advantage over the Erie Canal route upon which only small canal boats can go. However, there is a movement on foot to deepen the Erie Canal so that lake vessels can pass through it also.

FIG. 278.
One of the snow-capped mountain peaks of British Columbia.

Although southern Canada closely resembles the United States in climate and physiography, toward the north the coun-

try rapidly grows colder, until, in the extreme northern portion, the climate is frigid (p. 77). There the sea is frozen over in winter, and in summer it is covered with floating ice (Fig. 60). Even in midsummer large patches of snow are seen upon the land.

In the southern portion of Canada many people have their homes. Then comes a forest-covered belt inhabited by Indians, a few trappers, and large numbers of wild animals (p. 88). It is in this region that the Hudson Bay Company has many trading stations for the purchase of skins from the Indians and other hunters. This company has been of great importance in the development of Canada, for it has explored much of the wilderness and opened it up for settlement. Toward the north the forest merges into scattered timber, resembling the timber line of the mountain slopes (Fig. 74); and beyond this are the great *barrens*, or *tundras* (p. 78). Few large animals live there and almost no human beings, excepting scattered colonies of Eskimos along the coast.

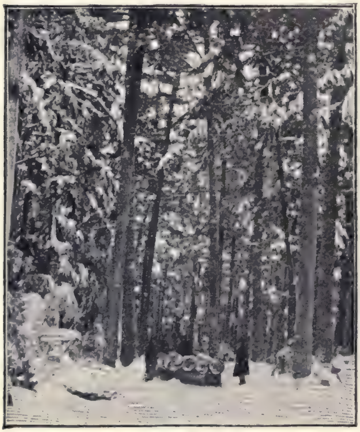


FIG. 279.
A winter scene in the woods of New Brunswick.

Lumbering. — The forests which cover northern Maine, New Hampshire, and Vermont extend into the hilly and mountainous section of New Brunswick and southern Quebec. In fact, from there westward to the Pacific, sweeping northward around the vast plains of Manitoba, this forest tract is from two to three hundred miles wide, and is estimated to include fully a million square miles. In the east the principal trees are spruce, balsam fir, pines,

and maples, while in the west are spruces, mammoth cedars, sometimes sixty feet in circumference, and the Douglas fir, which in some instances attains a height of three hundred feet (Fig. 280). This forest is so nearly in its primitive state that there are few parts of the continent where the hunting is so good.

FIG. 280.
One of the giant trees of British Columbia. Notice how small the man appears.

Lumbering is carried on in much the same manner as in the United States (p. 127). In the east the principal river down which the logs are floated to the sea is the St. John, upon which are situated FREDERICTON, the capital of New Brunswick, and ST. JOHN, the largest city in that province. In these two cities the logs are transformed into wood pulp and lumber. Immense quantities are shipped every year from the seaport of ST. JOHN.

In Nova Scotia, Prince Edward Island, and that part of Canada which borders Lakes Erie and Ontario, much of the timber has been cut off; but for scores of years the extensive forests of other parts of Canada and of Newfoundland will continue to supply lumber.

At present the woods of Canada are one of its greatest sources of wealth; the lumbering industry is so important that there are hundreds of sawmills at the rapids on the

streams, and even in the great cities. Among the latter, OTTAWA, TORONTO, and MONTREAL are important, especially in the manufacture of lumber into such articles as doors, blinds, barrels, and furniture.

FIG. 281.

A lumbering scene in New Brunswick.

Fishing. — It was the excellent fishing off the eastern coast of Canada that first attracted the French to America, and fishing is still an important industry in Canada. Fully fifty thousand people in Newfoundland and the eastern provinces, especially Nova Scotia and Prince Edward Island, are engaged in cod fishing. One of the best fishing ports is YARMOUTH in Nova Scotia, although a great deal of fishing is carried on from HALIFAX, Nova Scotia, ST. JOHN'S, Newfoundland, and many other places.

Inland fishing is also important. The streams and lakes of Canada still abound in trout, pickerel, and other fish, as did those of New England when that region was first settled. Many white fish are caught in the larger lakes for the market. The salmon, too, is found in eastern Canada; but instead of being caught in large numbers to be sold, as in the West, they are carefully protected. Indeed, most of the salmon streams

are under private control, and at the proper season only the owners and their friends are permitted to catch them for sport.

FIG. 282.

Boats setting nets to catch salmon off the coast of British Columbia.

Fishing is important on the west coast, especially for salmon, which are also caught in Maine (p. 139), western United States (p. 316), and Alaska. Great numbers of salmon come to the Canadian rivers every year to spawn, pushing their way up stream, in spite of many natural obstacles. Sometimes, in order to get beyond waterfalls,

FIG. 283.

Nets set to trap the salmon.

they must leap many feet into the air (Fig. 248), and it is interesting to watch the skill with which they are able

to spring out of the water and land in the foaming torrent at the crest of the falls. Sometimes they fail, but return-

FIG. 284.
Hundreds of salmon in a cannery.

ing to the task, they try again and again until successful. It is believed that a salmon always returns to the same river.

While travelling up the streams they are easily caught in nets set across the current (Fig. 282), or by dip nets in the hands of fishermen (Fig. 248), or sometimes by

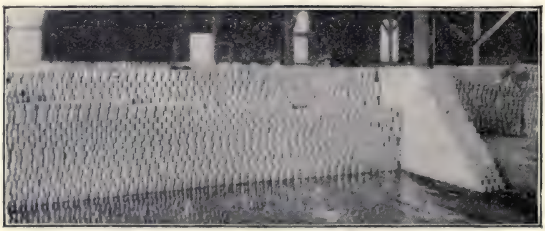


FIG. 285.
Salmon cans in a Canadian cannery. There are fully 60,000 cans in this room.

salmon wheels (Fig. 249). Immense numbers of salmon are canned in western Canada (Figs. 284 and 285) as well as along the Columbia River and in Alaska.

Sealing. — We have already learned (p. 327) about the seal fishing in Alaska. Seals are also found on the eastern side of Canada, but their fur is of little value. It is the layer of fat, or blubber, just beneath the skin, that is chiefly sought, because it is useful in the manufacture of oil. The Labrador seals rear their young on the fields of floating ice that drift southward in the Labrador current (Fig. 62). To reach these animals, strongly built steamers (Fig. 60) start out from

FIG. 286.

Newfoundland sealers killing seals on the floe ice off the coast of Labrador.

St. John's, Newfoundland, in the early spring, as soon as the ice has begun to break up enough for ships to push their way through. Upon reaching a group of seals, scores of men rush out upon the ice and kill as many as possible (Fig. 286); then they return to each body to remove the skin and blubber.

After the sealing season, which is over by May or June, some of these stoutly built steamers fit out for a cruise to the Arctic in search of the whale, which lives on the eastern side of America as well as north of Alaska (p. 326).

Agriculture and Ranching. — What was said about the agriculture and grazing of northern United States applies quite fully to Canada. The warm, damp winds from the Pacific render the climate of southern British Columbia much like that of Washington (p. 286) — an excellent one for wheat and hardy fruits.

Fig. 287.

Cattle on the Great Plains of western Canada.

Fig. 288.

Sheep on the plains of western Canada.

Farther east, especially on the plains at the base of the Rocky Mountains, in the provinces of Alberta and Assiniboia, the climate is too arid for farming. Therefore,

ranching is of importance, as in Montana and western Dakota (pp. 248 and 302). Immense herds of sheep (Fig. 288) and cattle (Fig. 287) are reared on these broad plains, in the midst of which are several towns. The largest of these is CALGARY, which has a population of about four thousand.

In Manitoba the climate begins to be more favorable for agriculture, and the wheat fields of Minnesota and eastern Dakota continue across the boundary far up into that province. Although the winters are long and exceedingly

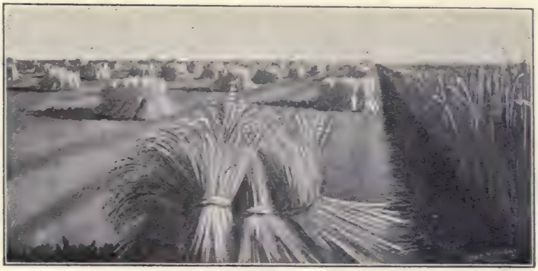


FIG. 289.

A wheat field in Manitoba.

cold, the summers are warm, so that grain, especially wheat (Fig. 289), oats, and barley, may be raised there. Why are the summers warm and the winters cold? (p. 72.)

In the centre of this great wheat region is the city of WINNIPEG, in which flour is manufactured, as in Minneapolis, and from which much grain is sent eastward by rail. This city is situated on the banks of the Red River of the North, which empties into Lake Winnipeg. Find out from the map (Fig. 275) what other large river is tributary to this lake; also the name of its outlet.

Farther east, on the peninsula between Lakes Erie, Huron, and Ontario, is found the best farm land in Canada. This district is in the province of Ontario, the most populous of the Canadian provinces, which includes nearly half of all the people in Canada. More than two-thirds of the inhabitants live outside of the large cities. What large cities do you find there?

Although this country is so far north, its climate is so modified by the water of the Great Lakes, that such crops as grapes, peaches, corn, and even tobacco are raised. In

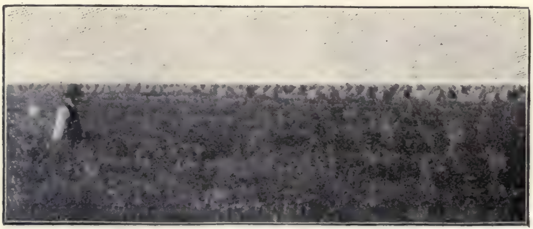


FIG. 290.

A field of flax, one of the products of Canadian farms. For what is flax used?

addition, great quantities of oats, wheat, barley, and considerable flax are grown there. The wheat is made into flour, mainly for home consumption; much of the barley is sent to the breweries of the United States; and the oats are fed to stock. Some of the finest horses in America are reared in the province of Ontario. This province is further noted for the amount of cheese it produces.

A strip of excellent farming country is found practically the entire length of the St. Lawrence River and along the southern shores of the Gulf of St. Lawrence. Prince Edward Island is an island of fine farms; but the people who live in the towns, especially CHARLOTTETOWN, the capital, are engaged

in commerce and fishing. Portions of Nova Scotia and New Brunswick, particularly along the coast and in the valley of the St. John River, are also farming districts. In fact, one of the most beautiful farming regions in all of Canada is in southwestern Nova Scotia, noted for many crops, but especially for delicious apples. It was there that the French settlements were made about which Longfellow has written in his Evangeline; and this is often called "The Land of Evangeline."

Mining. — Gold and silver are mined in British Columbia, as in the Rocky Mountains farther south; but there has been far less development of mining in Canada than in the United States. Not only are there gold and silver, but also lead and copper ores, building stone, and coal. Deposits of coal are found both among the mountains and in the plains farther east.

The famous Klondike region is situated among the Canadian mountains near the Alaskan boundary. Although so near the Arctic Circle, DAWSON CITY in the Klondike has rapidly grown to a city with over 10,000 inhabitants. The discovery of gold so near the Alaskan boundary, thus causing that section suddenly to become of importance, has given rise to a dispute between the United States and Canada as to the exact location of the boundary line.

Gold and silver are found in the province of Ontario, especially in the vicinity of the Lake of the Woods. Nickel is mined in Ontario, and some oil fields have been developed. A small quantity of gold is obtained in Nova Scotia and in Newfoundland, where some copper is also mined.

In spite of the abundance of iron ore in certain places, the scarcity of coal near at hand has prevented Canada from producing much iron. The coal fields of western Canada are quite inaccessible to the eastern cities, and the coal beds of the east have never been thoroughly developed.

In Nova Scotia, particularly on Cape Breton Island, there are extensive beds of bituminous coal of the same origin and age as those of Pennsylvania. Since these mines are on the very seacoast, and often on the shores of excellent harbors, the coal is readily loaded into ships; but the fact that the St. Lawrence is frozen in winter is a great disadvantage, not only to the cities along the rivers, but also to these coal mines.

FIG. 291.

A railway bridge across the St. Lawrence at Montreal, showing what a very broad river it is. Notice how small the long train of cars is when compared to the length of the bridge. There is no bridge across this river below Montreal.

Trade Routes and Cities. — There appear to be two outlets for eastern Canada, — one by way of the St. Lawrence, the other by the way of Hudson Bay. But the latter is practically useless because floating ice so clogs the narrow Hudson Strait that vessels are able to pass through it during only a few weeks of summer.

The St. Lawrence River suffers from the same disadvantage, though to a much less extent; and, in addition to the ice, there are dense fogs where the damp air from

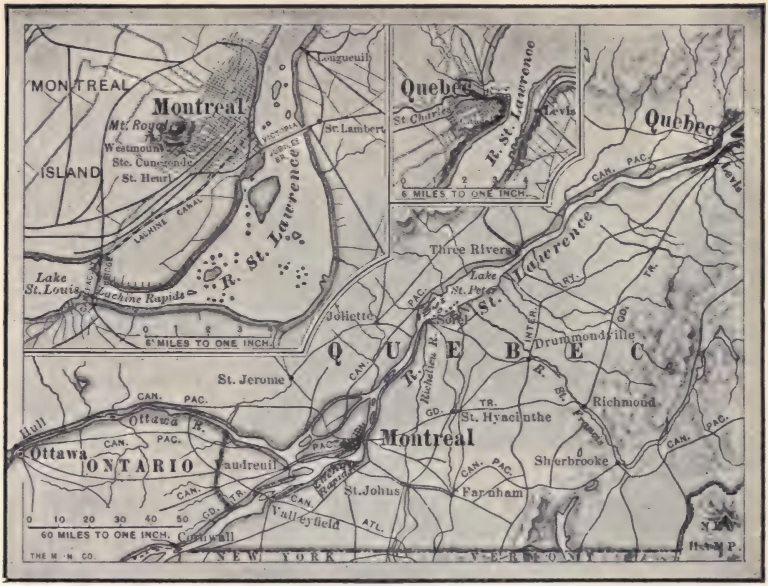


Fig. 292.

Map showing the location of Montreal and Quebec.

the Gulf Stream is chilled in passing over the cold Labrador current (p. 67). But in spite of these objections, the St. Lawrence offers a much better water route than that which has so much affected the growth of New York (p. 181). However, New York is so near the coal fields, and has such a productive territory to draw upon, that it has grown far more rapidly than Montreal.

The exact location of MONTREAL (Fig. 292), the principal city in Canada, is easily explained. It is on the St. Lawrence, at the mouth of the Ottawa River, and just below the Lachine Rapids which furnish a complete barrier to the passage of boats up stream. However, by entering

the canals mentioned on page 355, river and lake boats may go up the St. Lawrence; but ocean vessels must stop at Montreal. Thus goods from Europe may be carried to Montreal, fully a thousand miles from the ocean; then, by transferring to other ships, they may be carried on canals, rivers, and lakes as far as Duluth, more than twelve hundred miles farther inland. By this means, and by railways also, raw products from the north, east, south, and west collect at Montreal, either to be manufactured, or to be shipped farther.

FIG. 293.

Looking down upon the city of Montreal, with the broad St. Lawrence in the distance.

As in the large cities of the United States, manufacturing in Montreal is varied, including the making of sugar, boots and shoes, cotton and woollen clothing, India rubber goods, various steel and iron products, cigars, and multitudes of other articles.

Farther down the river is QUEBEC (Fig. 292), a city especially noted on account of its historical associations. It was the centre of the French government in Canada, and for a long time their principal city. It is situated upon a high bluff of the St. Lawrence, and is fortified so as to command that river.

For a long time Quebec was engaged in commerce to a greater extent than Montreal; but the better location of the latter city

has drawn the commerce away from Quebec, as the better situation of Boston drew the commerce away from Salem (p. 149). This has been greatly aided by the building of ship canals and by the dredging of the St. Lawrence, thus deepening the channel so as to admit great ocean vessels as far as Montreal.

Quebec is one of the quaintest and most interesting cities on the continent. It resembles a bit of the Old World, transplanted to America, and a visitor from the United States feels that he is indeed in a foreign country. Besides trading and commerce, there is some manufacturing in Quebec, particularly the manufacture of boots and shoes.

FIG. 294.
A view in a street in the French quarter of Quebec.

OTTAWA, another city of great importance, is above Montreal at some large falls in the Ottawa River. On account of its fine water power Ottawa has much manufacturing, and is especially noted for sawmills and other lumber manufactories. More than that, being the capital of the Dominion, it has some beautiful government buildings, known there as the *Parliament Buildings* (Fig. 295).

The second city in size in Canada is TORONTO, located on an excellent harbor on the shores of Lake Ontario. Being situated in the midst of a fertile farming country

FIG. 295.
The Parliament buildings, Ottawa.

and having water connection with coal on the east, and lumber and other raw products on the west, Toronto has become a manufacturing centre. Yet, in spite of this, the inhabitants have paid great attention to keeping the city beautiful, and it is one of the most attractive cities on the continent.

A number of smaller cities are located along this water route. PORT ARTHUR, which in position corresponds to Duluth in the United States, is a shipping point for grain, cattle, and other western products. WINDSOR (Fig. 209), opposite Detroit, shares some of the advantages of that city, being a shipping point and a manufacturing centre. Not far from Toronto, on the extreme western end of Lake Ontario, is HAMILTON, a manufacturing and trade centre; and there are other cities on the same peninsula, the largest being LONDON.

On the eastern end of Lake Ontario, near the Thousand Islands, is KINGSTON, which has cotton and woollen mills, car shops and locomotive works, besides being a lake port and railway centre. As in New England and New York, nearly all the towns and cities of this part of Canada are engaged

in manufacturing of one kind or another. Generally, in the first place, the presence of water power attracted sawmills, as in the case of PETERBORO, Ontario. Then, since the power continued after the forests were removed from the neighborhood, other manufactures were undertaken. This has been the history of great numbers of towns and cities of southern Canada and northeastern United States.

Railways have been of great importance in Canada, as in the United States. The greatest railway is the Canadian Pacific, which reaches from St. John, New Brunswick, where there is a good harbor, entirely across Canada to VANCOUVER on the Pacific coast. It is the shortest route from England to China and Japan, and much freight is sent that way. Across the strait, on the island of Vancouver, is the city of VICTORIA. With what two cities on Puget Sound may these be compared? How do they compare in size? (See table, p. 448.)

One of the oldest cities in Canada, and one that has an excellent harbor, is HALIFAX in Nova Scotia, which is about the size of Mobile in the United States. Notwithstanding its fine harbor and great age, this city has never become large. The reason is easily seen on examining the map (Fig. 275). There is almost no country back of it upon which it can draw to aid its growth. The narrow peninsula of Nova Scotia is not large enough to supply raw materials and manufactured articles in sufficient quantity to make it a great shipping point, and the country farther west is too difficult to reach. It is very much easier to send western goods to Montreal for shipment than to carry them so far as Halifax. Here, almost as well as in the case of New York and Montreal, we see why certain cities flourish or fail to flourish.

Islands North of North America

These cold and barren islands have almost no inhabitants. Scattered colonies of Eskimos are living along the coast (Figs. 24, 79, and 296), many of them in almost as primitive a manner as when the continent was discovered.

These people have adapted themselves to life in the Arctic region in a way that is truly remarkable (p. 92).

Fig. 296.

A Greenland Eskimo kayak.

They have no wood excepting the occasional pieces which drift to their shores; they lack vegetable food, excepting the few berries that are found in summer; and the land supplies them with almost nothing beyond a few birds and the caribou; yet they are able to exist, notwithstanding the terrible cold of the long, dark winter.

Through the summer the Eskimos travel about from place to place, pitching skin tents, or *tupics*, at points where seal are liable to be found. In order to obtain these they must venture upon the water in their *kayaks* (Fig. 296). These boats are made of the skins of sea animals stretched around pointed frames, made either of driftwood or of bone. In form the kayak resembles the Indian canoe, although it is even more easily upset.

The Eskimo handles his kayak very skilfully by means of a two-bladed paddle, which he dips into the water, first on one side of the boat, then on the other. On the top of the boat he rests his spears of different sizes, one for spearing fish, one for birds, and one for seals.

When the summer is over these people build more permanent homes, either of stone or snow or ice, the only building materials available (Fig. 79). Food is not abundant enough for them to lay up a supply for winter, and therefore they must hunt through the long winter night. At that time, in the search for seals, the men venture out over the ice-covered sea in *sledges*, drawn by dogs. Occasionally they come across a polar bear on a similar errand, when a battle ensues, in which the Eskimo is not always the victor.

From the seal, polar bear, walrus, and caribou the Eskimos obtain not only their food, but furs for their clothing, skins for their tupics, and blubber for their light and fuel. In fact, excepting for the stones and snow used in their winter homes, or *igloos* (Fig. 79), and occasional pieces of driftwood, they are dependent entirely upon animals for everything they use.

They are a happy and intelligent people. The latter fact is proved by the kinds of boats, sledges, and homes that they have invented, and also by the fact that they are able to live at all amid such surroundings. Their struggle for existence is probably greater than that of any other race.

They seem to have migrated to these islands from the west; and in their migration they have reached as far eastward as the east coast of Greenland. Large numbers dwell on the west coast of this immense island, which for a long time has been under the control of the Danish government. As a result of their contact with Europeans, the Greenland Eskimos have naturally given up many of their customs. They no longer build snow and ice igloos

FIG. 297.

A group of Eskimo children in Greenland.

in winter, but have permanent homes, usually made of turf and stone (Fig. 299), though in many cases of wood. The Danes have attempted to civilize these people and convert them to Christianity, and have supplied them with churches and schools.

From this region the Danes obtain supplies of blubber from the seal and walrus, ivory from the walrus, skins from the seal, reindeer, and polar bear, and eider-down from the eider-duck. In return for these products they supply European food, which the Eskimos have learned to like. The Greenland

Eskimos have gathered around the Danish trading stations, forming small towns. The most northern of these is UPERNIVIK, where white men live farther north than any others in the world. But some uncivilized Eskimos have homes still farther north.

Away from the coast the greater part of Greenland is a barren waste of ice and snow — the most absolute desert known in the world. Its area is about five hundred thousand square miles, or more than ten times as large as New York State. Throughout this entire area there is no living thing, not even the lowest plant or animal. Both Peary and Nansen have crossed this waste of ice, which reaches an elevation of over ten thousand feet above sea-level. In the higher portion, even in the middle of summer, the temperature remains below zero, and rain never falls. On this great highland the snow has accumulated to such a depth that, being changed to ice, it flows out as a glacier in all directions to the sea (p. 13).

FIG. 298.

A Greenland Eskimo mother and her two children, one carried in the hood of sealskin on her back.

As it advances into the sea (Fig. 11) fragments are constantly dropping from it, and as it pushes out into the deeper water great masses are broken off, forming icebergs (Figs. 12 and 61). The breaking away of a large iceberg is a wonderful sight, and, if one is too near, a dangerous experience. As it breaks loose, it fills the air with a multitude of reports resembling the discharge of many large guns; the sea is churned to foam, and the spray is dashed high in the air. Then it floats majestically away, like a small, white island, until, in a warmer climate, it melts and returns its waters to the sea, whence it came as vapor perhaps centuries before.

FIG. 299.

A part of an Eskimo town, showing the Danish buildings; and also, in the foreground, some Eskimo huts made of turf and stone.

REVIEW QUESTIONS AND TOPICS. — (1) Tell about the French in Canada. (2) What provinces constitute the Dominion of Canada? Locate each. (3) What about Newfoundland? (4) Where do the majority of Canadians live? Why there? (5) Compare southern Canada with the United States in physiography and climate. (6) Where is some of the grandest scenery? (7) The best farm land? (8) Name and locate the principal rivers. (9) What is the principal water route? (10) Mention some of the difficulties of shipping by that route. (11) Describe the climate, physiography, and vegetable life in northern Canada. (12) In regard to lumbering, tell about the extent of forest; kinds of trees; and cities most noted for lumber. (13) What provinces in the east are especially engaged in

fishing? (14) Name the important fishing ports. (15) Tell about the fish; about the salmon of the western coast. (16) Compare sealing in Alaska with that on the coast of Labrador. What use is made of the animals in each case? (17) Compare the agricultural products of Washington with those of British Columbia. Why so similar? (18) What is the principal occupation in Canada just north of Montana? Why? (19) Tell about the province of Manitoba. (20) Which is the most populous province in Canada? Why? (21) Where is "The Land of Evangeline"? (22) What mineral products are found in Canada? (23) Locate the chief mining regions. (24) Where are the leading coal mines? (25) Why is Hudson Bay not an important outlet for Canada? (26) How does the water route from the Gulf of St. Lawrence to Port Arthur compare with that from New York Bay to Duluth? Name particularly the advantages of each. (27) Give the reasons for the location of Montreal. (28) Mention the leading industries of that city. (29) Tell about Quebec. (30) About Ottawa. (31) About Toronto. (32) About each of the other cities mentioned. (33) Why is Halifax not a great city?

(34) What advantages do the Eskimos lack that we enjoy in abundance? (35) What substitutes do they find for them? (36) Tell about the habits of the Eskimos in summer and in winter. (37) How have the Danes influenced the Eskimos who live in Greenland? (38) Describe the interior of Greenland. (39) Tell about icebergs.

Suggestions. — (1) Compare the area of Canada with that of the United States (see table, p. 447). (2) The population also (see table, p. 447). (3) Find a picture of a salmon. (4) Collect pictures of different kinds of trees in Canada. (5) Tell the story of "Evangeline." (6) Lake Ontario is how much higher than Lake Erie? How are ships able to pass from one lake to the other? (7) Explain why Montreal has outgrown Quebec. (8) Why should Buffalo grow more rapidly than Toronto? (9) Write a story describing the pleasures of the Eskimos. (10) Collect pictures of Eskimos. (11) Find some one who has been in Canada, and have him tell you what he has seen there. (12) Find out more about the government of Canada. (13) Of what advantage is it to England to have such a large, productive colony?

For References, see page 442.

XV. COUNTRIES SOUTH OF THE UNITED STATES

MAP QUESTIONS: *Mexico.* — (1) Describe the relief of Mexico. (2) Name the two large peninsulas. (3) What river forms a part of the northern boundary? (4) What waters border Mexico? (5) Find the capital. (6) Find the largest seaport. (7) Compare the coast line with that of northeastern United States.

Central America. — (8) Name the countries. (9) What sea lies to the east? (10) What large lake do you find? (11) Examine the small map of the Nicaragua Canal. Describe the route proposed. Of what advantage is the lake?

West Indies. — (See map, Fig. 260, facing p. 330.) (12) Which is the largest island? (13) Name three others in order of their size. (14) What island lies south of Cuba? What is its capital? (15) What group of islands lies north of Cuba? To what nation do these islands belong? (16) What other nations own islands in the West Indies? (17) On the map, Figure 95, find the Bermuda Islands.

MEXICO

Physiography and Climate. — Mexico consists of four areas of different altitudes. Near the seacoast are coastal plains and other lowlands. In the interior, occupying a large part of the country, is an arid plateau. The third area includes the slopes between these two, and the fourth consists of peaks and mountain ranges which are a continuation of those in southern United States. Among the mountains, as in United States, there are a number of volcanic cones, two of them, Orizaba and Popocatepetl, being among the highest peaks on the continent.


MEXICO
AND
CENTRAL AMERICA
Scale of Miles.
0 100 200 300 400 500
Cities with over 200,000: ....Mexico
Cities with 50,000 to 200,000: ....Puebla
Smaller places: ....Saltillo
Capitals: ... Other Cities: ..
Longitude West from Greenwich
Comparative Area
PENN.
45,215 Square Miles.
ROUTE OF PROPOSED
NICARAGUA CANAL
GULF OF MEXICO
TROPIC OF CANCER
CARIBBEAN SEA
PACIFIC OCEAN
UNITED STATES
MEXICO
CENTRAL AMERICA
TEXAS
LOUISIANA
ALABAMA
GEORGIA
FLORIDA
ARIZONA
NEW MEXICO
CUBA
BAHAMA ISLANDS (Br.)
JAMAICA (Br.)
BRITISH HONDURAS (BELIZE)
GUATEMALA
HONDURAS
SALVADOR
NICARAGUA
COSTA RICA
PANAMA
New Orleans
Galveston
Havana
Mexico
Vera Cruz
Tampico
Matamoros
Monterey
Puebla
Guadalajara
Merida
Campeche
Key West
Santiago de Cuba
Kingston
PANAMA CANAL UNDER CONSTRUCTION ISTHMUS OF PANAMA
PROPOSED NICARAGUA CANAL
THE M.-N. CO.

FIG. 300.

This part of North America is narrow, and since the north and south divide causes some of the streams to flow eastward and the others westward, there can be no long rivers in Mexico. The steep slope from the plateau to the lowland gives the streams a rapid fall, so that they have cut deep canyons in the edge of the plateau. Moreover, the arid climate of the interior allows them little water. This lack of large, navigable rivers has interfered with the development of Mexico. Can you tell why?

FIG. 301.

A scene on the arid plateau of Mexico. A road bordered by cactus.

As in the case of our Southern States, the land has been rising instead of sinking. Therefore the coast is regular and there are few good harbors. Two projections form the peninsulas of Yucatan and Lower California, the former being a continuation of the mountain chain which made Cuba, Haiti, and Porto Rico. The latter is a southern extension of the Coast Ranges of the United States.

If the surface of Mexico were near the sea-level, the climate of the greater portion would be tropical; but owing to the differences in altitude, there are several dif-

ferent climates. The low coastal plains, near Vera Cruz and in Yucatan, are hot and damp, being reached by the trade winds and monsoons which blow across the Gulf of Mexico and Caribbean Sea. There is also considerable rain upon the cooler plateau slopes of eastern Mexico; but with the exception of these regions, the greater part of Mexico has too little rainfall for agriculture without irrigation. The northern part of Mexico is in the horse latitudes, the remainder in the trade wind belt. How does this explain the aridity? (See pp. 47 and 49.)

History. — After Columbus discovered the West Indies, the neighboring coast was visited and settled, and thus Mexico naturally came into possession of the Spaniards. One of the boldest of the Spanish invaders was Cortez, who conquered the Aztec and Pueblo Indians as far north as northern New Mexico.

Spain found so much gold and silver in Mexico that many Spaniards settled there. They developed the mines, started coffee plantations on the temperate slopes, established farms on the plateau where irrigation was possible, and carried on cattle ranching in the more arid portions. After their settlement the intermarriage of Spanish and Indians caused the population to become very much mixed; and there are now in Mexico not only savage Indians and semicivilized Aztecs, but many half-breeds, besides some pure-blooded Spaniards.

Spain governed Mexico so badly that the people rebelled, and in 1821 won their independence, establishing a republic with a government modelled after our own. There are a number of states, each with a government and capital, somewhat as in each of our states, and a central government with the capital at MEXICO CITY, where the Presi-

dent lives. For a long time Mexico also included the states of Texas and Colorado and the country west of them to the Pacific. Texas won its independence by war and joined the Union; and in the Mexican war the United States obtained the territory marked "ceded by Mexico, 1848," in Figure 357.

Agriculture and Ranching. — Although the climate of a large part of Mexico is arid, much agriculture is carried on by the aid of irrigation, which is made possible by

FIG. 302.
A Mexican ploughing with a wooden plough.

reason of the snow and rain among the mountains. On the irrigated farms the products of the temperate zone are raised, such as wheat, corn, and beans — the latter being one of the staple products of the Mexican diet. Much fruit is also produced, especially apples, pears, peaches, and grapes.

The Mexican farming methods, which are very crude, are a mixture of ancient Aztec customs and those introduced from Spain. In Mexico one may still see the wooden plough (Fig. 302), which barely scrapes the ground, and also the wooden-wheeled cart, drawn by oxen (Fig. 85).

The home life of the people is interesting. Their houses have but one story and are commonly built of a brick made of clay mixed with straw, and then dried in the sun (Fig. 303). These sun-dried bricks, or *adobes*, are larger than the bricks that we use, and are piled tier upon tier, being joined by layers of mud. Often there is but one room, the ceiling being made of brush, and the floor of nothing but the earth. In this one room the whole family cooks, eats, and sleeps. Their food usually consists of very simple materials, such as unraised bread, baked in the fireplace, beans, and occasionally meat, commonly cooked with red pepper. Men, women, and children use tobacco.

FIG. 303.

An adobe house in Mexico.

While this description is true for the poorer classes, it of course does not apply to the wealthier class of Mexicans. Nevertheless even these have the same kind of architecture, which resembles that of southern Spain (Fig. 309), introduced into the latter country by the Moors many centuries ago.

Upon the arid plateaus, the plants resemble those in western United States (p. 81), and among them are found the sage bush, the mesquite, and the cactus (Figs. 45, 69, and 70). One among them, known as the *maguey*, or *agave* (Fig. 304), is very widely used in Mexico. Its stout, sharp-pointed leaves rise from near the ground in a tuft. In the centre of this rests the flower stalk, which

sometimes reaches a height of forty feet, and bears a cluster of white flowers on the top. It is also called the *century plant*, because it requires so long to reach maturity and produce this flower stalk. However, one hundred years are not necessary for that purpose, but from ten to seventy years, according to the climate. From the fermented juice of this plant the Mexicans obtain an alcoholic drink known as *pulque*, and by distilling it, a drink known as *mescal*. The tough leaves contain a fibre which is made into paper and strong thread. So valuable is the maguey that it is carefully cultivated upon plantations (Fig. 305).

Fig. 304.
The maguey.

Fig. 305.
A field of maguey plants.

On one species of cactus (Fig. 306) in Mexico and Central America live tiny insects known as the cochineal insects. The insects are collected, killed by means of heat, and then dried in the sun, when they resemble small berries of a purplish color. They are used in the manufacture of red and carmine dyes, which are of great value.

FIG. 306.
The cochineal cactus.

As in western United States, large parts of these arid plateaus cannot be reached by irrigating ditches. Such parts are valuable for cattle and sheep ranches. Horses and goats are also raised, but neither horses nor mules are used so much in Mexico as in the United States. The most common draft animal is the little jackass, or *burro*, sometimes as small as a Shetland pony. It is a patient creature, with great endurance, and capable of carrying heavy loads. It is especially useful among the mountains because it is so sure-footed. Not uncommonly one sees several burros loaded down with wood to such an extent that their long ears and short legs are the principal parts in sight.

On the damp lowlands, rice, sugar-cane, and cotton are produced; also tropical fruits, such as oranges, bananas, and pineapples, quantities of which are exported from southeastern Mexico. Upon the slopes between the tropical lowlands and the temperate plateau, considerable tobacco and coffee are raised.

The latter requires a rich soil, abundant moisture, a warm climate, and plenty of shade. In order to secure shade, the coffee bush, which reaches a height of from ten to fifteen feet, is

FIG. 307.

A coffee bush in the shade of a tree whose trunk is seen on the right.

planted in the shade of higher trees. A white blossom appears as early as March, and after the flower falls off the coffee berry begins to grow. It resembles a dark red cranberry. On the outside is a husk enclosing two kernels that fit with the flat sides together; and in order to prepare the coffee for the market the outside husk must first be removed. This is sometimes done by the Mexicans in a very crude way; but on the larger plantations, machinery is employed.

FIG. 308.

The coffee berry.

Southern Mexico.—In southern Mexico, near Central America, there are dense tropical forests from which are obtained many valuable woods, such as mahogany, rosewood, and logwood. Elsewhere in that country forests are rare, excepting upon the higher mountains. In fact, there is so little forest land that the Mexicans living on the arid plateau find difficulty in obtaining wood for fuel.

Much of this is dug from the ground; for some of the arid-land bushes, notably the mesquite, have long, thick roots which make excellent firewood.

Besides the valuable woods of the tropical forests, southern Mexico produces the vanilla bean, which grows upon a climbing plant. In the seed-pod are nestled the very fragrant beans which are used for flavoring extracts, for perfumeries, and for medicine. Pepper, made from the dried berry of a tropical plant, is also obtained in Mexico. Indigo, useful as a dye, is likewise obtained from a berry in this region, and sarsaparilla from the roots of a tropical plant.

The Mines. — One of the principal objects that the Spaniards had in exploring the New World was to obtain the precious metals, gold and silver; and both in Mexico and South America they were rewarded in their search by the discovery of very rich mines, some of them having been previously worked by the Indians. Mexico is still a great mining country, producing almost as much silver as the United States, and being the second silver-producing nation in the world. There are also some mines of copper and lead.

Many of the mines are now operated by Europeans and Americans, so that modern methods have been introduced; but in some of those managed by Mexicans, primitive methods, similar to those used by the Indians, are still employed. Large areas have never been carefully examined for ore. In fact, some parts of the country are still occupied by Indian tribes, who not only prevent miners from coming in, but even defy the government.

There are immense deposits of iron in Mexico, but they are not worked, chiefly because of the absence of coal. Among the mountains and plateaus are found many valuable building and ornamental stones, such as marble, but these also are

scarcely worked at all. In one section there is onyx, so much prized in making clocks, vases, lamps, and table tops; and opals of great beauty occur in some of the lavas that have poured forth from the volcanoes. They are so common that one is able to buy a beautiful opal for a few cents.

The Cities. — While great numbers of Mexicans are engaged in farming and ranching, and are therefore scattered over the country, they have, wherever possible,

FIG. 309.
The Mexican city of Leon.

gathered together in villages and small towns. These communities are often necessary in order to obtain the water supply needed for irrigation. It is usually too great a task for a single farmer to build a ditch; and therefore a number combine and thus live close together.

In a few places, too, there are large cities, the greatest being MEXICO CITY, with a population of about 350,000. In this city, as in numerous other places in Mexico, there are many fine buildings, especially cathedrals; for the

Mexicans, like Spaniards in other parts of the world, are chiefly Roman Catholics.

Another city in the interior is PUEBLA, founded in 1531, and now having a population about equal to that of Cambridge, Mass. It is situated near one of the ancient cities, or pueblos, of the Aztecs. SAN LUIS POTOSI is larger than Peoria, Ill., and there are a number of other cities with a population of fifty thousand and over.

FIG. 310.

A view in Guadalajara, showing the typical one-story Mexican houses made of adobe.

Since the eastern coast of Mexico is low and sandy, it has no good harbors, the two largest cities on the seacoast being TAMPICO and VERA CRUZ, whose harbors are protected by breakwaters. There are good harbors on the western coast, as that at ACAPULCO; but since it is backed by high mountains and a worthless country, that port has never become important.

Many of the Mexicans are very ignorant, for the schools are not so well developed as in the United States. Another reason why little progress has been made is that the poorer people have been kept down by the wealthier Spaniards. While slavery is not permitted, a system that amounts to almost the same thing is in vogue. Large numbers, known as *peons*, are in the employ and under the control of wealthy Spaniards, who keep them in debt, and who, therefore, practically own them.

Because of the ignorance of the working class, and the absence of water power and coal, there is very little manufacturing in Mexico; and that which is done is largely carried on by hand. However, even the uneducated Mexicans are quite artistic, and are able to do some beautiful kinds of hand-work. They weave silver and gold threads into what is known as filigree jewelry, which is often of great beauty. The women and girls, by drawing threads from pieces of linen so as to make delicate patterns, produce the Mexican drawn-work that is so much prized in this country.

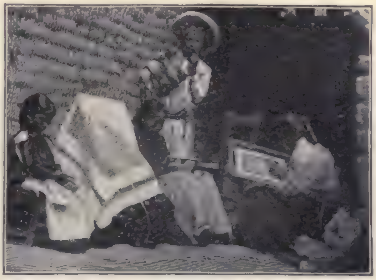


FIG. 311.
Making Mexican drawn work.

Besides this hand-work on a small scale, there are large tobacco factories in the tobacco district. Some earthenware is also manufactured, and some cotton cloth; but there are no manufacturing towns, no great watch and shoe factories, and no immense blast furnaces, such as we find in the New England, Middle Atlantic, and Central States.

CENTRAL AMERICA

The Republics. — South of Mexico are five small nations, known as the Republics of Central America, each of which has a government modelled after that of the United States. They are, however, not good examples of republics, chiefly because of the ignorance of the people. An ambitious general, obtaining a few followers, is liable at any time to start a revolution and overturn the existing government. There is an almost constant state of turmoil in these nations; war after war has occurred; presidents have been deposed

or murdered; and such a state of unrest has existed that there has been little chance for development. Their political condition resembles that of the country in which they live, which is subject to disastrous eruptions of volcanoes, and to earthquakes of great destructiveness. They truly live in the midst of a state of unrest.

Fig. 312.
Picking bananas in Guatemala.

The earthquake shocks have levelled towns and killed thousands of people. For instance, San Salvador, the capital of the country by that name, was so frequently destroyed by earthquakes that the inhabitants decided to choose a new location for their city; but the one they selected is hardly better than the one they abandoned.

Most of Central America is mountainous; and, being in the tropical zone, the climate is hot. It is also exceedingly damp, the trade winds causing the rainfall on the eastern coast to be especially heavy. It is so rainy that there are dense jungles along the shores of the Caribbean Sea.

Of the five countries forming the Central American group, the smallest is San Salvador, the next, Costa Rica. Nicaragua, Honduras, and Guatemala are about equal in size. In addition to these, just south of Yucatan, is British

Honduras (or Belize). The largest city in the group is New Guatemala, the capital of Guatemala, having a population of over seventy thousand. Like San Salvador, the inhabitants have been forced to change its location, which was formerly at the base of two very active volcanoes; hence the name, *New* Guatemala.

A large portion of these countries is occupied by dense tropical forests from which are obtained mahogany, rosewood, logwood, fustic, and other valuable cabinet and dye woods. The rubber tree also grows there, and the production of rubber is one of the industries of the region.

Fig. 313.
Loading a train with bananas in Costa Rica.

As in Mexico, coffee is raised on the hill slopes in the shade of the forest trees. One of the most important districts for this industry is Costa Rica. Bananas (Figs. 312, 313), sugar, tobacco, indigo, and cocoa are other products of Central America.

Some gold and silver are obtained, the former near Bluefields, the latter in Honduras. The inhabitants are mainly Indians, Spaniards, or half-breeds; and owing to the uneducated and even uncivilized condition of the great majority, there is practically no manufacturing carried on in these countries.

The Nicaragua Canal. — To us one of the principal points of interest connected with this region is the building of canals across the narrow strip of land which separates the Atlantic from the Pacific. One canal has already been started between the towns of COLON and PANAMA on the Isthmus of Panama. The distance is only about fifty miles, and the elevation but three hundred feet at the highest point. This, the Panama Canal, has been especially supported by the French.

FIG. 314.
Natives sorting coffee in Costa Rica.

A second route favored for a canal, and one that finds favor in the United States, is the Nicaragua route, which is much longer, but passes over an elevation only about half as great as the Panama Canal. Moreover, a large part of the distance is occupied by a river and by Lake Nicaragua (Fig. 300), the largest lake in North America south of the United States. This lake is about ninety-two miles long and empties into the Caribbean Sea through the San Juan River.

Either of the canals would be of great service to the seacoast cities of North America and Europe. By such

a canal a steamer going from London to San Francisco would save five thousand miles, while eight thousand miles would be saved between New York and San Francisco. Examine a globe to see why more would be saved in the latter case.

FIG. 315.
Loading bananas on a ship in Honduras.

THE WEST INDIES

(Map, Fig. 260, opposite p. 330.)

From the Yucatan and Florida peninsulas a chain of islands reaches to the mouth of the Orinoco on the South American coast. These enclose the Caribbean Sea; and, with the aid of the peninsulas of Florida and Yucatan, the Gulf of Mexico also. Because of the mistake made by Columbus, these islands are to this day called the West Indies. They are often known as the Antilles.

With the exception of the northern portion of the Bahamas, this entire archipelago lies within the tropics, and therefore has a warm climate; and, since all of the islands are reached by trade winds from the sea, the climate is damp. There are many scores of islands in the group, only a few of which are large. Two of these,

Cuba and Porto Rico, have already been described (pp. 330 to 336). To whom do they belong? What else can you tell about them?

Jamaica. — South of Cuba lies the Island of Jamaica, the third in size in the West Indies, and a possession of Great Britain. Its capital is KINGSTON, a city nearly as large as Portland, Me. This island is mountainous in the centre, but has an excellent soil on the lower slopes and in the valleys, and is very productive. The inhabitants are mainly negroes or mulattoes, there being fully forty negroes to one white person. Many of them are exceedingly lazy, and work only when obliged to do so. The women do outdoor work fully as much as the men, and it is no uncommon sight to see them working, not only in the sugar-cane fields, as in the United States, but even carrying loads of coal or bananas into the ships.

FIG. 316.
A grass house on a tobacco plantation in Jamaica.

The occupation of the Jamaicans is chiefly agriculture. One of the main products is sugar-cane, which is made

into sugar, molasses, and rum. Early vegetables and fruits, such as oranges and bananas, are also raised. Jamaica ginger, of which every one has heard, is obtained from the root of a plant that grows in this island.

Haiti. — The island of Haiti, just east of Cuba, and second in size among the West Indies, is occupied by two

FIG. 317.
A field of sugar-cane in the West Indies (St. Croix).

negro republics, Haiti and Santo Domingo. The capital of the former is PORT AU PRINCE; and of the latter, SANTO DOMINGO.

It is a very mountainous island, having one peak which reaches more than ten thousand feet above sea-level. A large portion of the land is still covered with forest containing mahogany, logwood, and other valuable tropical woods. Many of the natives obtain their living in the most primitive fashion, like the negroes of Africa; but others, especially near the seacoast, are engaged in raising sugar,

tobacco, coffee, and bananas. They rarely produce, however, more than enough for their own needs.

This was the first large island discovered by Columbus in 1492, and here he made settlements and opened mines. A cathedral which was partially built in 1512 is still standing in

FIG. 318.

A group of negro natives in the West Indies (Barbadoes).

Santo Domingo. In those early times Indian natives were seized as slaves and obliged to work in the mines, and after much cruel treatment were finally exterminated. Negro slaves were brought from Africa, and the descendants of these are the present rulers of the two republics.

For a while Spain developed Haiti, and even opened mines which showed that there is much mineral wealth among the mountains. The later history of the island has been complex; it was ceded to France, then won its independence. After that Spain twice conquered the eastern end of the island and was twice driven out. In these wars the natives were aided by the mountainous nature of the country; for small bands could live among the mountains out of reach of their oppressors, and yet near enough to cause them constant trouble.

The experiment of black republics has not been very suc-

cessful, although the governments in Santo Domingo and Haiti are no worse than those in Central America. Freed from the restraint of foreign control, many of the natives have gone back to savage customs; and in the interior of Haiti are found many habits and religious beliefs that now exist in the wilds of Central Africa.

Lesser Antilles. — Most of the islands among the Lesser Antilles are possessions of Great Britain, though some

Fig. 319.

A tropical scene in the West Indies (St. Croix).

belong to other nations. For instance, Martinique and Guadeloupe belong to France; St. Thomas and St. Croix to Denmark; and others to Holland. Many of these small islands are volcanic cones, built upon the crest of a moun-

tain ridge which is mainly beneath the sea (Fig. 1). Most of the volcanoes now appear to be extinct, though in 1797 and 1843, in Guadeloupe, and in 1812, in St. Vincent, there were volcanic outbursts. Hot water and steam still rise from the craters in other islands, showing that the volcanic fires have not altogether died out.

The products of these islands are similar to those of Jamaica, Cuba, and Porto Rico (pp. 331–333). As throughout the West Indies, the most important of all is the sugar-cane. However, the increased use of beet sugar in Europe has taken away one of the principal markets for the sugar of these islands.

The Bahamas. — North of Haiti and Cuba are several hundred small islands, called the Bahamas. A number of these are inhabited, and on one is situated the city of NASSAU. These islands have been built by coral polyps. In the warm waters of the Gulf Stream (p. 71), which sweeps over the shallow bank on which the islands lie, these minute sea animals have built reefs. Waves have washed the dead coral fragments together, forming bars and beaches, and the wind has blown the coral sand into low sand-dune hills. In this way the islands have been made.

Sponges are obtained from the clear warm waters of the Bahama banks. To obtain them, the natives either cruise about in boats, dragging the bottom, or they strip off their clothes and dive into the clear water, tearing the sponge from the bottom to which it is clinging.

The sponge is made by colonies of tiny animals, which together build a horny substance, much as coral polyps build coral. When brought to the surface the sponge little resembles those that we use, for animal matter fills the pores and spreads over the surface. This must be removed before the sponge is ready for market.

From the land, early vegetables, pineapples, oranges, and cocoanuts are raised by the inhabitants, who are chiefly negroes. One of the industries on these islands is caring for winter visitors. Why should people wish to go there?

The Bermudas

Far out in the Atlantic, alone in mid ocean, and 600 miles east of the Carolinas, is a cluster of small islands, known as the Bermudas, the largest being only 15 miles

Fig. 320.
A view from one of the coral sand hills, showing some of the tiny islands of the Bermuda group.

long by one or two miles in width. Their foundation is a volcanic cone covered by the water of the sea. The top of this cone is veneered with a layer of coral remains. As in the Bahamas, coral polyps are still busily engaged in building reefs, the waves are washing the coral fragments upon the beach and grinding them to coral sand, and the wind is slowly drifting this about, forming dunes.

Being in the open ocean, and surrounded by warm currents, the Bermudas have a delightful and equable climate. In midwinter, when people in the same latitude in the

United States are shivering with cold, those in Bermuda are able to sit out of doors late at night.

This group of islands, which belongs to Great Britain, is inhabited mainly by negroes and mulattoes, who are engaged in raising early vegetables, especially potatoes and onions, for the American market. Another important product is the Easter lily, great fields of which are raised for the Easter season. At a time when few plants are in blossom in the Northern States, one may see acres of the beautiful Easter lilies in Bermuda, while birds are singing joyfully and everything indicates summer.

It is natural that many persons from the United States should be attracted to such a climate every winter. The majority of these visitors stay in the largest city, HAMILTON, where, aside from the climate, the scenery is enjoyable in the extreme.

REVIEW QUESTIONS AND SUGGESTIONS

Mexico: QUESTIONS.—(1) Describe the surface of Mexico. (2) Why are there few good harbors? (3) Tell about the temperature and rainfall in the different parts. (4) Give the history of Mexico:—the early settlement; the industries developed; the present government; the loss of territory. (5) Mention the leading products from the irrigated farms. (6) Tell about the methods of farming. (7) About the home life. (8) Name some of the plants on the arid plateaus; what products are obtained from them? (9) What are the chief products on the damp lowlands? (10) On the slopes farther inland? (11) Tell about coffee raising. (12) In what part of the country are the forests? (13) Name the valuable woods. (14) Name the products of southern Mexico. (15) Tell about the mining of precious metals. (16) What other mineral products are obtained? (17) Locate the principal cities in the interior. (18) On the coast. (19) Tell about the condition of the people. (20) Why is there little manufacturing? (21) What kinds are there?

SUGGESTIONS. — (22) On Figure 65 notice how the plant zones are affected by the different altitudes in Mexico. (23) Find out why coffee raising requires special care. (24) Find an article of furniture made of mahogany. (25) Walk toward Mexico City. (26) What reason can you discover for its location? (27) Examine a piece of Mexican drawn work. (28) Compared with water routes, are railways more or less important in Mexico than in United States? Why? (29) Collect pictures of Mexican scenes. (30) Find some one who has been in Mexico, and have him tell you about it. (31) Who is the President of Mexico? (32) Make a sketch map of Mexico.

Central America: QUESTIONS. — (33) Name the five nations in Central America. (34) To whom does Belize belong? (35) What about the earthquakes in Central America? (36) Describe the climate. (37) Locate some of the cities. (38) What products of Mexico are also found in Central America? (39) On the map locate the canal that has been begun across the Isthmus of Panama. (40) Where is it proposed to start another? Give reasons in favor of each.

SUGGESTIONS. — (41) What disadvantages do you see in the lack of a central government for all the Central American republics? (42) In what other ways besides saving coal would a canal there prove of advantage? Let a committee be appointed from your class to obtain definite facts about the matter by writing to some ship company. (43) Why would harbors at each end of the canal be necessary? (44) Make a sketch of Central America.

The West Indies: QUESTIONS. — (45) Into what groups are the islands divided? (46) Tell about their climate. (47) What can you say about Jamaica? (48) What two republics on the island of Haiti? Name their capitals. (49) Give the history of the island. (50) What are its products? (51) How have most of the Lesser Antilles been formed? (52) What is their principal product? (53) How have the Bahama Islands been built? (54) Tell about the sponges. (55) Name some of the other products of the islands.

SUGGESTION. — (56) How does each of the four largest islands compare in area and population with New York State? (See tables, pp. 446 and 447.)

The Bermudas. — (57) How have the Bermudas been built? (58) What are their products?

For REFERENCES, see pages 442–443.

SUMMARY AND CONCLUSION

Physical Geography.— The natural advantages that North America possesses as a home for man have been the result of slow changes extending through millions of years. How have the mountains been brought into existence? (p. 2) and where are the principal chains? How was coal formed? (p. 3.) What portion of the continent was covered by the glacier? (Fig. 13.) What work of advantage to us did it accomplish? (pp. 16–19.) In what ways is the more recent rising or sinking of the coast of importance? (p. 19.)

Where does our heat come from? What would be the result if the earth's axis were not inclined? (p. 29.) How does the change of seasons affect our habits? What are the causes of these changes? (p. 31.)

What great service do the winds render? Explain the cause of wind (pp. 39–42). What are the trade winds? (p. 42.) The prevailing westerlies? (p. 50.) Cyclonic storms? (pp. 52–55.) How is North America affected by each?

Tell about the ocean currents near our eastern coast (p. 66). Near our western coast (p. 68). What is the influence of each?

What about the variety of climates in North America? (p. 76.) In the United States? How do the animals and plants vary? (pp. 77–90.) Describe the manner of life

among the Indians (p. 93). What European nations endeavored to obtain possession of large sections of this continent? (pp. 97–101.) Give some reasons why the English succeeded most fully (p. 101).

Population. — At the present time there are probably more than a hundred million people living in North America, distributed among the four greater sections as follows :

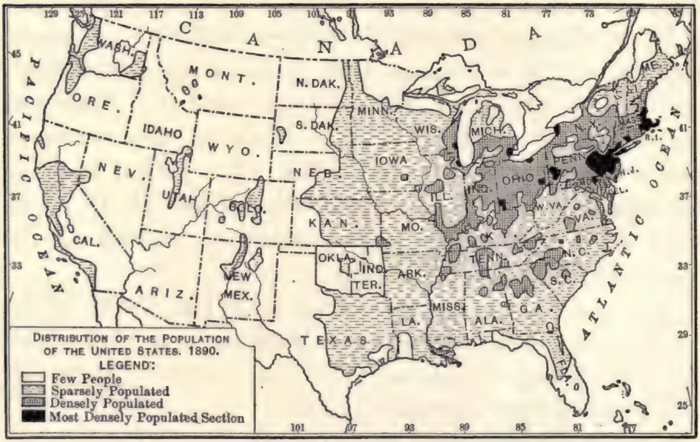


FIG. 321.

Central America, over three million ; Canada, fully six million ; Mexico, over thirteen million ; and the United States (not including dependencies), more than seventy-six million. From these figures it is evident that about three-fourths of all the inhabitants of the continent are living in the United States. Figure 321 shows the density of population in the different parts of the Union. Where is the most thickly settled quarter? Why? The most sparsely settled? Figure 323 gives the location of

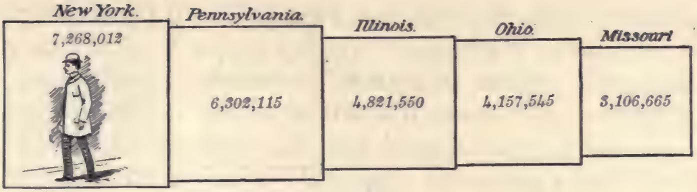


FIG. 322.

The five states having the greatest population. In this and all the other similar figures the relative importance of the states is indicated by the area of the squares.

the cities, the largest having the largest dots. On page 447 is a table of the largest cities. Find the dot (Fig. 323) that represents each city and give its population. In what respect are these two figures (321 and 323) alike?

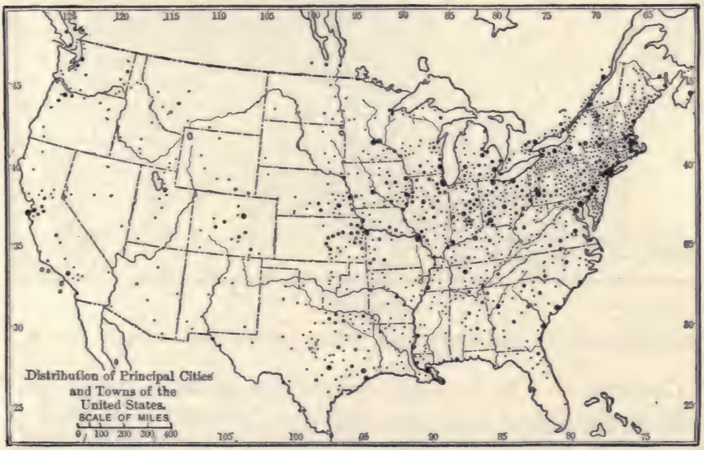


FIG. 323.

The star shows the centre of population of the United States.

Country and City. — The great cities are so numerous, and are so often mentioned, that there is danger of over-

estimating their importance as compared with the country. At the time of Washington very few people lived in cities. Even at the present time about two-thirds of our seventy-six million inhabitants live either in the country, or in towns with a population of less than eight thousand. In Mexico and Canada the proportion living in cities is still smaller. In other words, the great majority of persons in North America are country people.

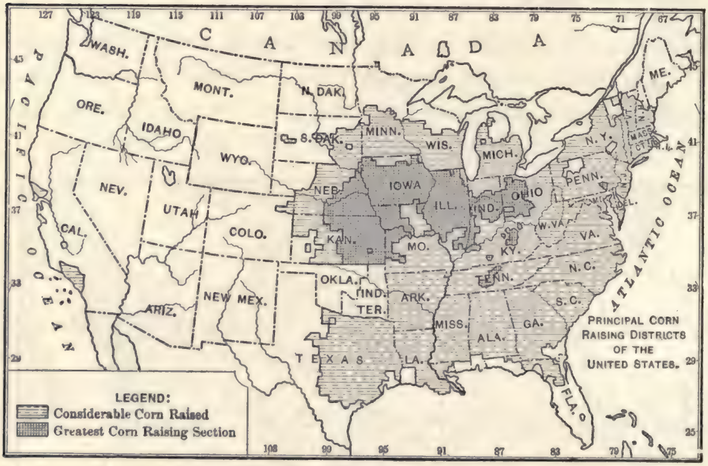


FIG. 324.

On these maps the spaces left blank indicate either little or no production.

Country. — The leading occupations of those living outside of the cities have already been studied. AGRICULTURE is the most important of all. At the present time there are over five million families occupying farms in the United States. About how many persons does that represent? Why should so many people live on farms?

Figure 324 shows the regions that are extensively en-

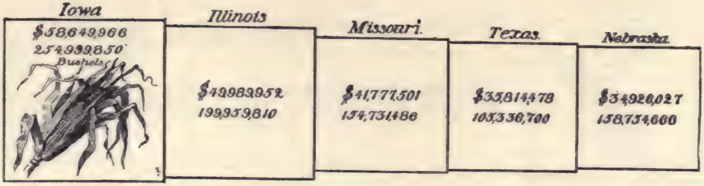


FIG. 325.

Corn production, in dollars and in bushels, in the five leading corn-producing states.

gaged in raising corn. What states are included? In 1898 nearly two billion bushels were produced; how many is that to each of our inhabitants? How is corn cultivated, and what are its uses? (p. 243.)

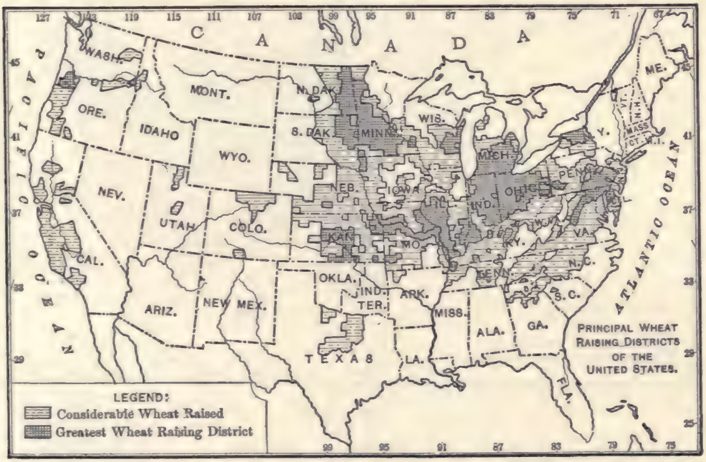


FIG. 326.

Many of the states that raise corn are also extensively engaged in the wheat industry. Figure 326 shows the wheat regions. Tell about wheat in the valley of the Red

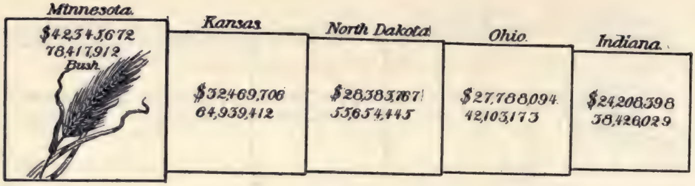


FIG. 327.

Wheat production, in dollars and bushels, in the five leading wheat-producing states.

River of the North, and about the Dalyrymple farm in particular (p. 246). Wheat and corn are our most valu-

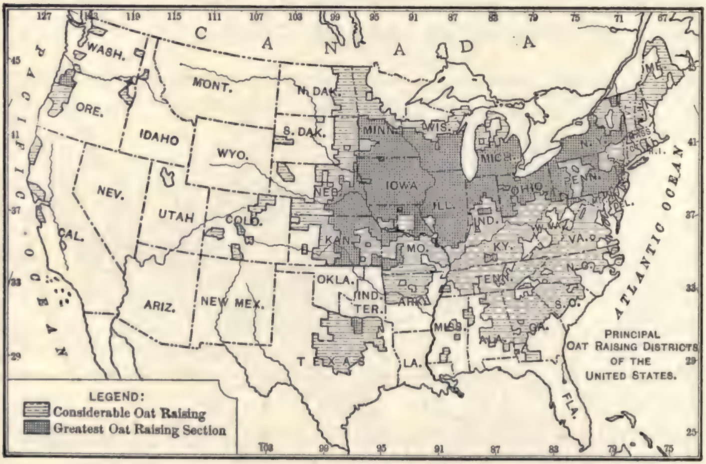


FIG. 328.

able food crops. In what section are oats raised (Fig. 328). Compare with Figures 324 and 326. What other grains can you mention, and for what is each used?

The cotton belt is confined entirely to the southeastern portion of the country, as shown in Figure 330. Why?

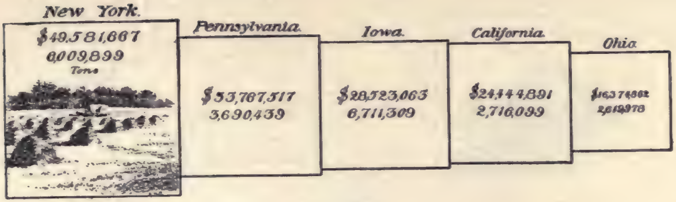


FIG. 329.

Hay production, in dollars and tons, in the five principal hay-producing states. For what is hay used?

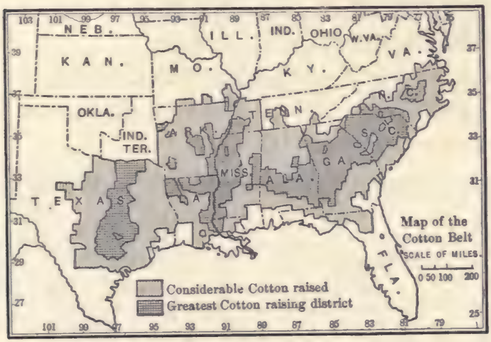


FIG. 330.

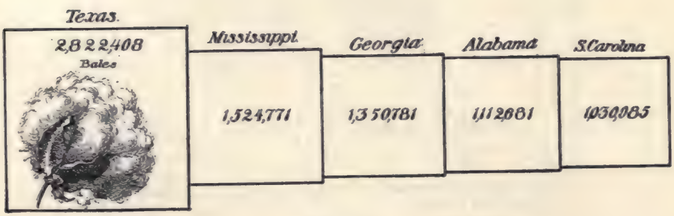


FIG. 331.

Five principal cotton-producing states.

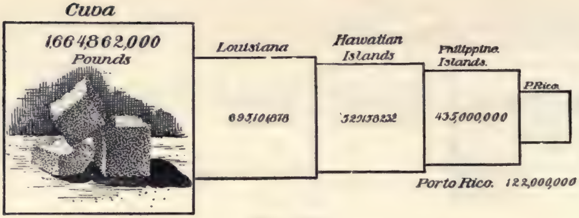


FIG. 332.

Principal sugar-producing districts in the United States and its dependencies

Name the principal cotton-raising states. Tell about the growth and uses of cotton (p. 209). Where in these states are sugar and rice grown? How is the work carried on? (pp. 212, 213.)

According to Figure 333 what states are largely engaged in tobacco growing? What is the appearance of the plant, and how is it cultivated? (p. 165.)

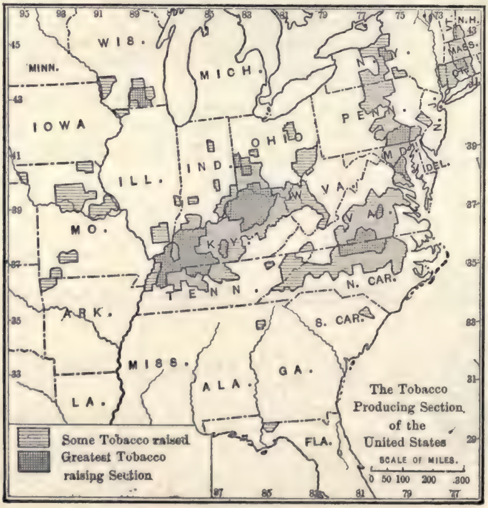


FIG. 333.

Below are three figures showing the principal states from which some of the other important farm products come.

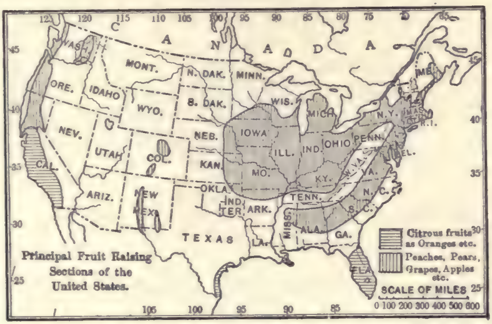


FIG. 334.

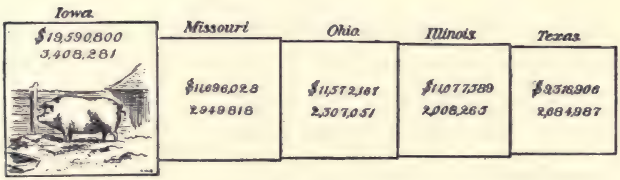


FIG. 335.

Number of hogs and their value in the five principal states.

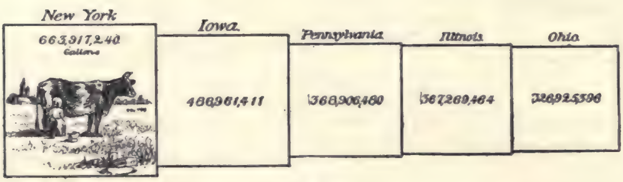


FIG. 336.

Five principal milk-producing states.

FIG. 337.

MINING is a second industry which confines people largely to small towns and to the country. About four hundred thousand men are employed at it. How many different metals can you name? How many other products can you mention that are obtained from underground?

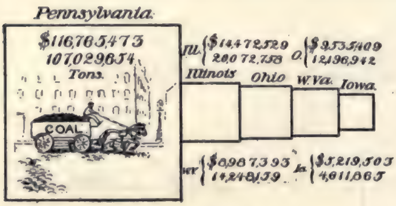


FIG. 338.

Coal production, in dollars and tons, in the five leading coal-producing states.

Of them all, the *fuels* are probably the most valuable. Why? What kinds are there? Figure 337 shows how extensive the *coal-beds* are. Name the states in which the greatest quantities of coal are mined. Of what importance is it that there are coal-fields in so many parts of the

country? What kinds of coal are there? And what are the differences between them? (pp. 4–5.) Describe a coal mine (p. 171). What are the uses of coal?

Name the chief states in which petroleum and natural gas are found. Tell also how they have been produced during the past ages and what their uses are (p. 173).

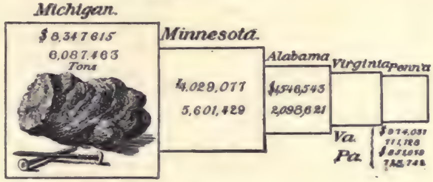


FIG. 339.

Iron ore production, in dollars and tons, in the five leading iron ore-producing states.

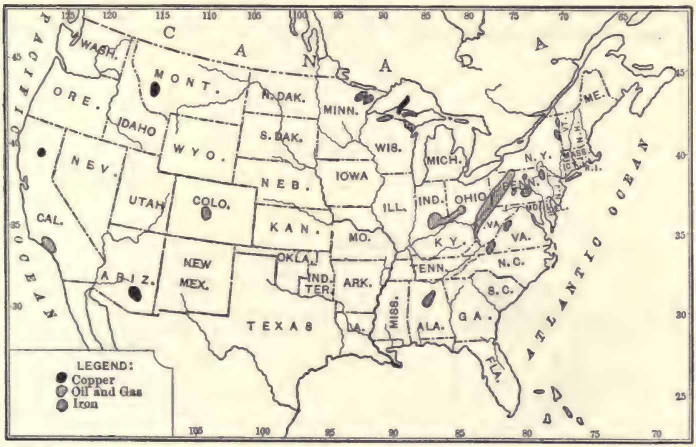


FIG. 340.

Leading iron, copper, oil, and gas producing regions.

The ores producing iron are among the most important of the mineral products. Why so important? Where are the principal iron-producing regions? (Fig. 340.) How

FIG. 341.

Gold and silver producing regions indicated by crosses.

is pig iron made? (pp. 175–177.) Why is not the Lake Superior district a favorable place for smelting iron ore?

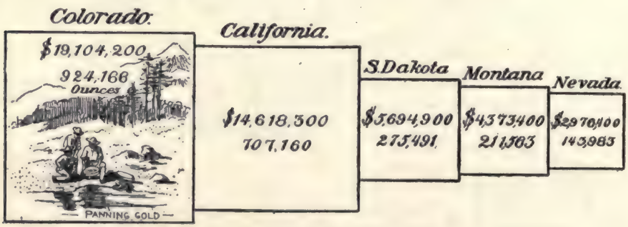


FIG. 342.

Gold production, in dollars and ounces, in the five leading gold-producing states.

Among the metals of great importance to man are the precious metals *gold* and *silver*. Describe three methods of gold mining (pp. 289–290). Tell about gold and silver

mining in California and Colorado (pp. 288–292). In what other parts of our country are the precious metals

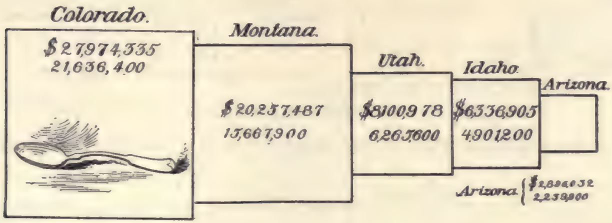


FIG. 343.

Silver production, in dollars and ounces, in the five leading silver-producing states.

found? What two sections are most noted for copper mining? Tell about that industry in each (pp. 258 and 292). Where and how is stone quarrying carried on in New England? (pp. 133–136.) Also salt mining? (p. 169.)

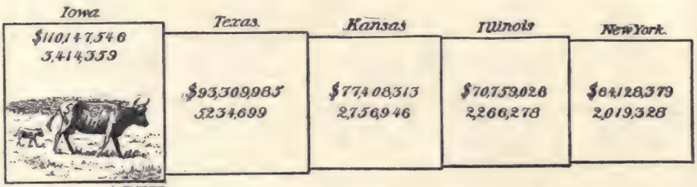


FIG. 344.

Number of cattle and their value in the five principal cattle-producing states. Many of these are kept, not on ranches, but on farms in the Eastern states.

GRAZING is a third important rural occupation. Point out on the map (Fig. 97) the portions of the country largely given up to it. Why these? Relate how cattle

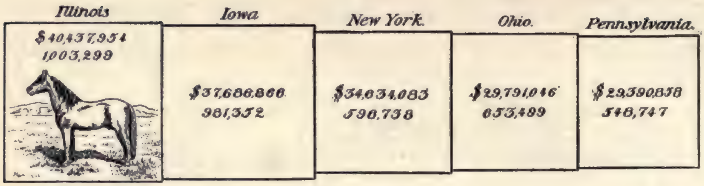


FIG. 345.

Number of horses and their value in the five principal horse-producing states

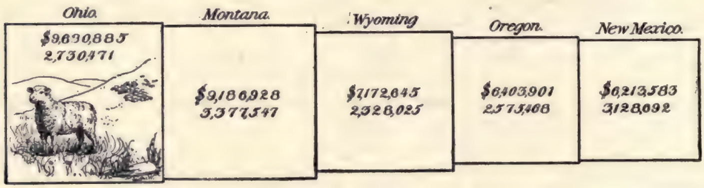


FIG. 346.

Number of sheep and their value in the five leading sheep-producing states.

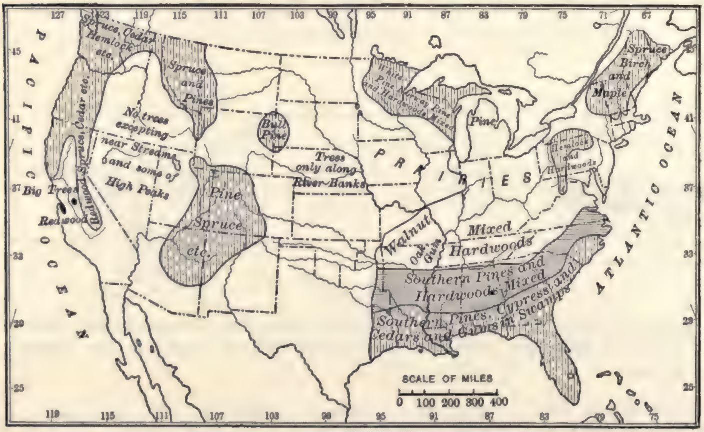


FIG. 347.

Map showing the regions from which considerable timber is now being obtained.

ranching is carried on (p. 248); also sheep ranching (p. 303). Which states are most important in these industries?

LUMBERING is a fourth great industry that attracts people to the country. Figure 347 shows the distribution of the forests. Describe the industry as it is carried on in Maine (p. 127). In the Southern States (p. 205). In Michigan (p. 252). In the Northwest (p. 293). Why these differences? Which are the most common kinds of trees? What are the products of the forest besides lumber? (pp. 132 and 207.)

FISHING is a fifth prominent occupation outside of cities. In what sections is it especially important? Describe how codfishing is carried on (p. 137); salmon fishing (p. 360); the oyster industry (p. 163).

FIG. 348.

Sections where ocean fish are found.

Altogether, therefore, there are five industries that lead the greater part of the inhabitants of the United States to live in small towns or in the country. Name these occupations. They furnish us with the raw materials for *food*,

clothing, and *shelter*. What raw materials enter into each, and whence does each come?

Cities. — What are the principal occupations in the cities? The answer has been repeatedly suggested. What, for instance, are the main kinds of business in Duluth? (p. 261.) In Minneapolis? (p. 271.) In Chicago? (pp. 262–267.) In Buffalo? (p. 186.) In New

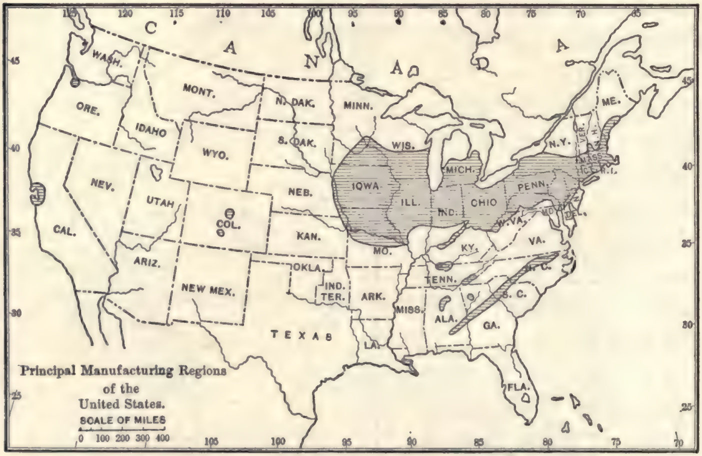


FIG. 349.

York? (p. 187.) In Baltimore? (p. 193.) In San Francisco? (p. 312.) Tell what is done in various cities with grain, ores, hides, cotton, wool, lumber, and fish.

It is evident that one of the principal occupations in cities is MANUFACTURING. Where, for example, is the making of iron goods especially important? Tobacco? Sugar? Paper? Farming implements? Furniture? Freight and passenger cars? Cotton cloth? Woollen

cloth? A single large factory may employ thousands of workmen (p. 147), and where hundreds of factories are established, as in New York, Chicago, and Philadelphia, there must be an enormous population. More than five million persons are engaged in manufacturing in the United States.

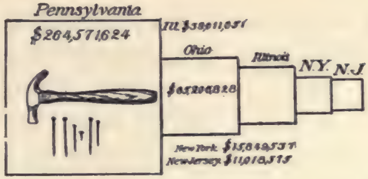


FIG. 350.

Value of iron manufacturing in the five leading iron manufacturing states.

A second great occupation in cities is that of BUYING and SELLING. Although grain, cotton, wool, etc., are produced in immense quantities in the country, they are not generally bought and sold there. That work must be carried on where there are great numbers of people;

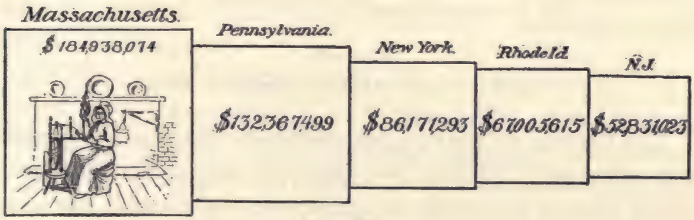


FIG. 351.

Value of the manufacture of textiles (cotton, wool, etc.) in the five leading textile manufacturing states.

for where else could it be done so successfully? If a person living in a city should want only a bushel of potatoes, he would not go to a farmer for them, but to a store to which many other people also go to buy goods. So also, if you were a farmer in Illinois and wanted to buy a carload of cattle to fatten, you would not go out West to

a cattle ranch, but probably to the stock yards at Chicago, where many cattle are always to be found. Or if you had a quantity of cotton to dispose of, where else could you do it better than in some city where cotton is bought and sold, as in New Orleans or Memphis? Not only must there be *stores* where we can buy what we need, but there must also be *centres*, or cities, where goods may be bought and sold on a still larger scale. A city bears much the same relation to the country round about that a store does to the people who live near enough to trade there.

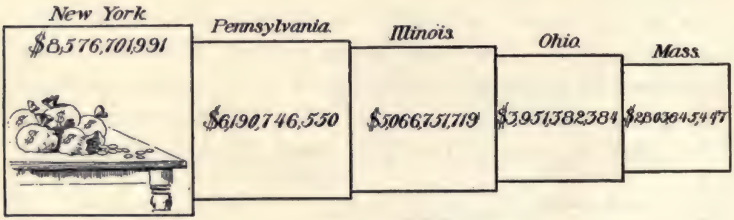


FIG. 352.

Wealth in dollars of the five wealthiest states.

The trading in every large city is of two kinds, — *retail* and *wholesale*. There are grocery stores, for example, which supply the resident families with the small amounts of flour, sugar, salt, and other groceries that they need from day to day. These stores, which carry on a *retail* trade, exist by hundreds in various parts of the large cities. Of course the storekeepers must have places where they can buy the goods which they sell. That is, there must be *wholesale* stores, some dealing in groceries, others in dry goods, and still others in fruits; and there must also be companies which carry on a wholesale trade in coal, lumber, cotton, and many other materials.

On page 187 it was stated that the wholesale buildings in New York occupy several square miles on the southern end of Manhattan Island; and in other large cities similar stores are usually found collected in one section. A large company engaged in the wholesale business, not only sells to those who come to buy, but it also sends out travelling men who, as their agents, journey from town to town taking orders for goods. There are now fully three hundred thousand of these commercial travellers, journeying about in the United States as agents of the wholesale houses of the larger cities.

Since enormous quantities of raw material must be shipped into the cities for the manufacture of goods, and since most of the finished articles are sent away, the business of SHIPPING, or TRANSPORTING, is a third great occupation in cities. Tens of thousands of men are employed all the time in loading and unloading cars, boats, and wagons.

In this country fully four million persons are employed in buying, selling, and transporting, or in COMMERCE, as these kinds of business together are called. What raw products are taken to Detroit, and what finished products are taken away? Answer the same in regard to Milwaukee, Peoria, Louisville, Providence, Denver, and New Orleans. If your home is in the city, answer the same for that; if not, for the nearest city.

Thus there are three leading occupations in cities; namely, MANUFACTURING, TRADING, and TRANSPORTING. Every city has all three; but some that are particularly distinguished for the first are known as MANUFACTURING CENTRES; and others, distinguished especially for the second, are known as TRADE CENTRES. Minneapolis is an

example of the former, and St. Paul of the latter. Give other examples of each. Those cities, like Boston, New York, Philadelphia, Baltimore, Chicago, San Francisco, and Montreal, whose location is especially favorable for the shipment of goods, are great COMMERCIAL CENTRES, and usually also manufacturing centres. Why?

The relation between country and city is now clear. Nearly one-half of our men are engaged in obtaining raw materials, and the remainder are mainly engaged in manufacturing them into useful articles, in buying, selling, and transporting them. Show by numerous examples how neither class can well do without the other.

But while they are so dependent, the life of one is very different from that of the other. Recall farm life as described on page 240. What notion have you gotten of farm life on southern plantations? Of the miner's manner of living? The ranchman's? (p. 252.) The lumberman's? (p. 128.) The fisherman's? (p. 137.)

Recall, on the other hand, what was said about life in New York City (p. 189). Give your notion of factory life. Of life in trade and transportation.

What attractions and objections do you find in each of these several occupations? Is the work of a farm hand more or less narrowing than that of a factory hand? Why? Suppose that two young men are much alike in ability, disposition, and training; how are they liable to grow unlike if one chooses mining for an occupation, and the other chooses trade? Give other instances showing how the work that one follows influences his manner of life and development.

It is difficult to determine which occupation requires the hardest work, for success demands one's best effort, no

matter what the occupation be. But of those living in the city on the one hand, and in the country on the other, which are more certain of the ordinary necessities of life? Why? Which have more comforts? Why? Which are more independent in general? Why? Which have the better opportunities for amusement? Why? For education? Why? For homes with plenty of light and fresh air? Why?

For many years the population of cities has been increasing more rapidly than that of the country, which suggests that people are preferring city to country life. Can you give any reasons for this in addition to those already mentioned?

Both city and country people are finally dependent on Mother Earth for all that they have: minerals can be obtained because of certain changes that have been going on for ages; most of the soil has been prepared either by the slow decay of rock, or by the grinding up of rock by the glacier; the sun's heat, together with the rotation and revolution of the earth, determines our seasons, our winds, rains, and ocean currents, in short, climate of one kind or another. The facts presented in the first chapters of this book constitute the foundation for everything that follows; for it is as a result of these facts that we are able to live as we do.

Dependence of Different Sections upon one Another.—No one locality produces many of the materials needed there. Which of your foods are not raised near your home? How about the knives, forks, dishes, and spoons? How about the clothes that you wear?

Because of the climate, water power, soil, or for some other reason, each part of the country is especially fitted

for producing one or several things, as eastern Kansas for grain, and western Kansas for stock, northern Maine for lumber, etc. Indeed, most of the articles used in each part of the country must be brought from other places. Name the materials that the Montana ranchman needs from the Southern planter; from New England; from Minneapolis and Chicago. Upon what parts of the United States are the inhabitants of Florida dependent? What do they supply in return? Make a list of the materials used in the construction of your house, and, as far as possible, determine where each one may have come from. The different parts of the country are of vital importance to one another, much as different parts of the body are.

Relation to our Territories and Dependencies. — Despite our broad territory and enormous number of products, there are some necessary articles that are either entirely lacking, or cannot be produced in sufficient quantities within our own borders. Name a few (see table, p. 455). Mention some that we are therefore glad to receive from Alaska, Cuba, Porto Rico, the Hawaiian Islands, and the Philippines. Mention others that they likewise are glad to receive from us. State, then, how the United States and its dependencies are of advantage to one another.

Other Countries of North America. — The principal industries in southern Canada and Newfoundland are necessarily similar to those in the northern United States. What about agriculture there? (p. 363.) Where is coal mined? (p. 365.) Precious metal? (p. 365.) What about grazing? (p. 362.) Lumbering? (p. 356.) Fishing and sealing? (pp. 358–361.) Compare the raw products of southern Canada with those of our Northern States.

Name and locate the principal cities. The leading trade route. Mention the chief kinds of manufacturing. (For above, see pp. 366–371.)

Describe the surface of Mexico (p. 378). The climate (p. 379). What are the agricultural products from its arid plateaus? (p. 381.) From its lowlands? (p. 384.) From the slopes between? (p. 384.) Tell about the forests of Mexico (p. 385). The mining (p. 386). Give some reasons why there is little manufacturing in that country (p. 389). Locate the principal cities.

Name the five republics of Central America. Describe the surface of the country and the climate (p. 390). Name the principal industries (p. 391). Tell about canals across the isthmus (p. 392). Mention the largest islands among the West Indies. What are their chief industries? (pp. 394–398.) What industries in the United States are not found in Canada? In Mexico? In Central America? What industries in any one of the latter countries are not found in the United States?

Our Relation to Other Countries. — The United States, like one small locality, produces far more of some materials than we can consume, while other important articles must come wholly, or in part, from abroad. Give examples of each. If we could not secure a market for our products in foreign lands, we should suffer seriously; and, if the foreign countries could not be induced to provide us with what we need, we should suffer again. Other countries are in the same condition. Show how that is true of Canada; of Mexico. There is excellent reason, therefore, for a constant exchange of goods among the nations of the world. How does the size of our country give us a great advantage in this respect?

We sell more goods to Great Britain than to any other foreign land. In fact, hundreds of millions of dollars' worth of cotton, wheat, flour, cattle, corn, meat, and oil are sent to that country every year (see table, p. 455). We receive in return, large quantities of woollen, cotton, and rubber goods, and articles made of vegetable fibres, hides, and skins (see table, p. 455). Trade is carried on in the same manner with Germany, France, and other countries. The goods that we send forth are called *exports*, and those brought in, *imports*.

Our ten leading exports (1898), named in order of value, are: (1) breadstuffs, including wheat, corn, flour, and other grains; (2) cotton; (3) meat and dairy products; (4) iron and steel goods; (5) mineral oils; (6) animals, particularly cattle; (7) lumber and articles made of wood; (8) cotton goods; (9) tobacco; (10) leather goods. From what part of the United States does each of these chiefly come?

Our ten leading imports are (1898), in order of value: (1) coffee; (2) sugar and molasses; (3) silk; (4) chemicals, drugs, etc.; (5) hides and skins; (6) vegetable fibres and articles manufactured from them; (7) cotton and goods made from cotton; (8) wool and woollen goods; (9) rubber and rubber goods; (10) fruits and nuts. In the table, page 455, find the regions from which these materials chiefly come.

More than half of all our exports and imports are sent by way of New York alone. Why? Other ports, next in importance, are: Boston, Baltimore, Philadelphia, New Orleans, Galveston, and San Francisco. The total value of our exports in 1898 was $1,231,482,330; of our imports, $616,049,654 (see table, p. 455).

Some imports are permitted to enter the country free; but upon most of them there is a *duty,* that is, a charge for the

privilege of entering the country. This duty is a source of income or *revenue* for the government. It is also intended to serve as a protection to home industries by preventing foreign products from being sold in our country at a lower rate than we can produce them. However, it sometimes causes considerable hardship. For example, a citizen of the United States, living even on the very border of Canada, cannot buy from that country such articles as lumber and wood pulp without paying a duty upon them. This causes us to pay a higher price for some articles than we would have to pay if no duty were placed upon them. Therefore, the boundary line between two neighboring countries is often of real importance as a barrier to free trade.

FIG. 353.

Navigable rivers represented by heavy lines.

Transportation Routes. — The chief inland water routes for transportation of goods have often been mentioned. What are they? About twice as much freight is carried

over the Great Lakes as on the Mississippi system. Mention some of the principal kinds carried on each. The fact that the Great Lakes system extends so far east and west is of great importance. This route, by furnishing a cheap means of transportation to the Eastern coast, opens up a very productive region in a favorable, temperate climate. Upon reaching the coast these goods may readily be shipped to Europe, our principal foreign market.

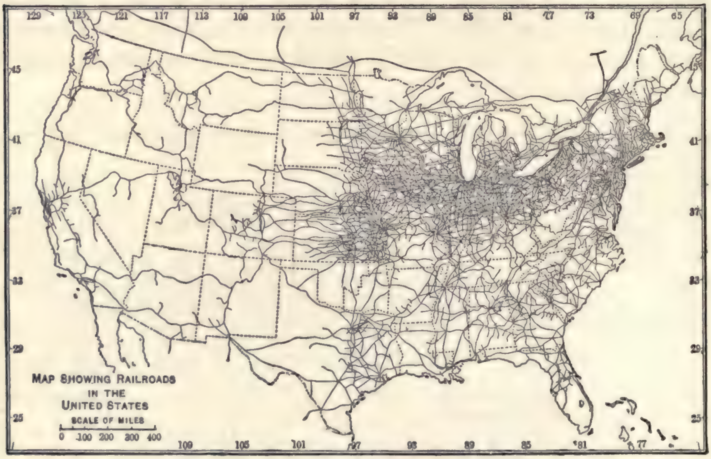


FIG. 354.

Map showing the network of railways in the United States.

It is largely because of these facts that most of the people of the country are living either along the northeastern coast or else from there westward to the Mississippi. On Figure 323 find the centre of population in the United States.

Figure 354 shows an enormous number of railways in the United States. They now carry fully three times as much freight as all the water routes together. In what

part of the country are most of them found? Why there? Which quarter is next best supplied with them? Which portion has fewest lines? How does the location of lines on this figure compare with the location of cities on Figure

Fig. 355.

Some of the principal railway lines of North America.

323? What about the *direction* of a majority of the railway lines? Count the number of railways that reach east and west across the western half of the continent (Fig. 355). In what city on the Pacific coast does each of these terminate?

Influence of Steam and Electricity. — The steam used upon the waterways and railways has been one of the most powerful factors in populating and developing our country. A century ago it required two days to travel from New York to Philadelphia, and six days from New York to Boston. In the latter case only two trips per week were made by stage. The journeys were not only very tiresome, but were also filled with hardships, and often with dangers. There were but thirteen daily papers in the United States, and neither papers nor books could be

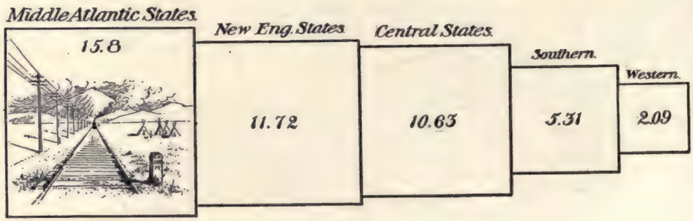


FIG. 356.

The figures represent the number of miles of railway for every one hundred square miles of territory in each of the five groups of states.

sent by mail. Letters cost from six to twenty-five cents, according to the distance, and, as the expense of carrying them was so great, they were not sent from the smaller towns until a number were collected.

Now we can travel as far in an hour as formerly in a day, and with much more convenience. There are fully two thousand daily papers, and these, as well as letters, may be sent quickly and cheaply to every section of the country. We can even send a telegraph message to a distant point in an instant, and can talk by telephone with a person hundreds of miles away, even recognizing

the tones of his voice. To one of our ancestors of a century ago either one of these wonders, to which we are now so accustomed, would have seemed an utter impossibility.

Influence of Modern Inventions on Mode of Life. — The effect of such a mighty change is seen in every direction. Each year thousands of carloads of fruit are shipped to Eastern cities from California. If there were no railways, how could it reach these cities? What, then, would be the effect on southern California? Also how could the corn of the Central States be marketed? And how could furniture, sugar, etc., be brought to the Western farmer's door? Trace other results of this change.

If we were suddenly deprived of our quick transportation, within a few days there would be a famine in every large city. Even now, when heavy falls of snow block the trains only for a day or two, the supply of milk, meat, and other necessities quickly runs low, and the prices rise to several times their ordinary value.

If we had no railway trains, there might also be extensive famines from time to time over large areas of country, as there were in the olden times, and as there are even at present in China. Why especially in China? As it is, however, hundreds of articles of food and clothing are quickly brought from distant points at a trifling cost. Mention several such articles. No one locality is in danger of suffering from want of food because, if the supply fails there, it is easily obtained from other sections.

The effect of steam and electricity on the industries and inhabitants of cities is striking. Persons living scores of miles away often do much of their shopping in the cities. Also, owing to trolley lines, elevated railways, and other

means of rapid transit, those engaged in manufacture or commerce are enabled to live many miles distant from their places of work and thus secure more healthful homes in the suburbs. Because so many people are able to have their homes in the suburbs, the cities are not nearly so overcrowded as they otherwise would be.

Influence of our Surroundings on Education and Government. — When our Union was formed, more than a cen-

FIG. 357.

Map to show when and how the United States obtained its territory.

tury ago, many wise persons believed it an almost impossible experiment. Our population was scattered over so many hundred miles along the Atlantic coast (Fig. 86) that people living in one part were apt to know and care little about those in another part far away. It seemed probable that quarrels and wars would arise, as a result of differences of opinion, and therefore that our

republican government might be dissolved into several governments.

Nevertheless, our boundaries have been so enlarged as to include far more territory than was originally thought possible (Fig. 357). Aside from that, more than eighteen million foreigners have settled in our country since 1821, bringing to our shores all the principal races of mankind (see table, p. 454), and many of the leading languages (Fig. 358), religions, and political beliefs of the world; but in spite of all this we have kept in such close touch with one another that our Union has grown stronger and stronger.

FIG. 358.

Left-hand figure shows countries from which most of our immigrants come. Right-hand diagram shows the proportion of our population which is native and foreign.

Each day, by rail and water, articles are being sent to all parts of the country. In all the states the people read the same news every morning, and whatever books are found especially valuable in one section are quickly made known in others. Thus we not only enjoy far better opportunities for education than formerly, but we learn to *know* one another; we have the same thoughts, and we

feel a mutual sympathy. So far as meeting and understanding one another are concerned, our country is really far smaller than it was a hundred years ago; we are living together like one very large family.

It has been a difficult task to convert people from so many quarters of the globe to one common product, called *Americans*, who believe heartily in our republican government (p. 107). But the attempt has not been a failure. Many have gone to the farms, where they have helped to supply the raw products; others have gone to the mining regions; but great numbers have settled in the cities, where they are chiefly engaged in work connected with manufacturing and commerce. Some are densely ignorant; but the great majority steadily improve in condition, adopt the American customs and ideas, and become good citizens.

Relation between Man and Earth. — The success of our experiment has been due not alone to the people, nor to the form of government, though both people and government have aided. The country has been one of splendid opportunities: vast forests have supplied us with lumber in abundance; fertile soils, broad plains, and varied climates have made it possible to raise, not merely *abundant* crops, but many different kinds; arid plains have invited the ranchman; and mountains and plateaus have yielded mineral fuels, iron, copper, gold, silver, and other mineral products in excess of our own needs.

Not merely are there raw products of nearly all kinds that we need, but there are abundant opportunities for changing them into the various manufactured articles which help to supply our wants. Water power and coal for manufacturing are easily accessible over a large part of

the country. Our water routes (Fig. 353) and abundance of excellent harbors furnish natural facilities for the movement of raw materials and manufactured products, and the temperate climate is favorable to the development of an energetic race.

The American people have been equal to the task of making good use of these unexcelled natural resources, and the free government has encouraged them to be independent, and has fortunately placed few unwise restrictions in their way. Thus the development of the nation, as well as of single industries, has been due not alone to *men*, but, in large part also, to their *surroundings*. The relation of man to earth, which it is the province of geography to present, is therefore seen to be very intimate, from whatever standpoint we may consider it.

THE TWO HEMISPHERES.

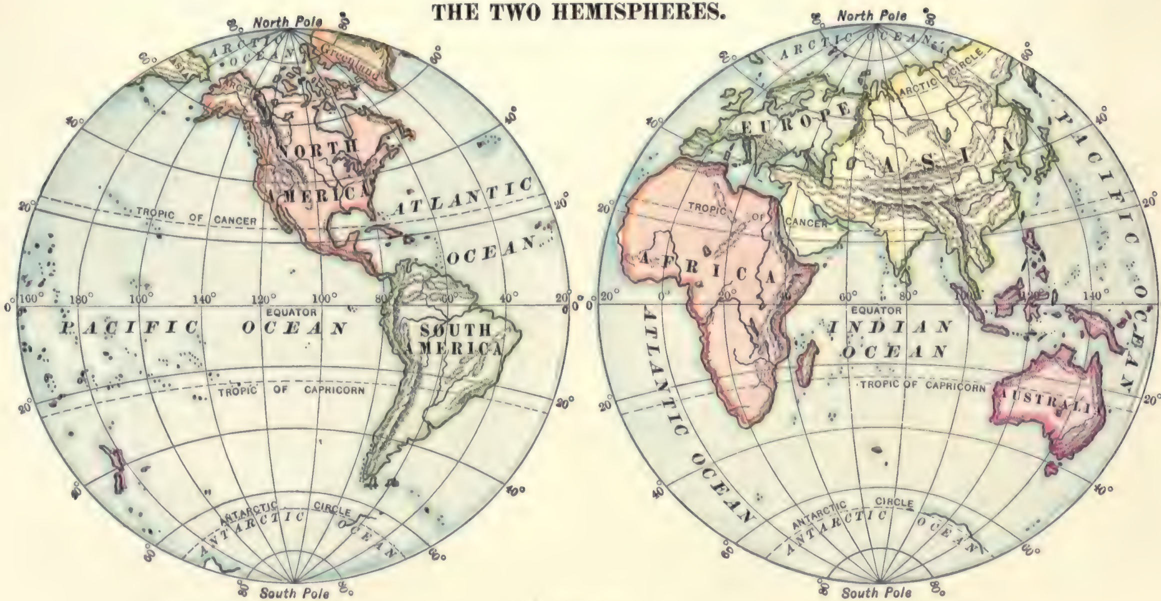


FIG. 359.


THE WORLD
ON MERCATOR'S PROJECTION
0 1000 2000 3000 4000 5000
Scale of Miles along the Equator.
Longitude East from Greenwich
Longitude West from Greenwich
Longitude East from Greenwich
C. Chelyuskin
ARCTIC OCEAN
FRANZ JOSEF LAND
SPITZBERGEN
NOVA ZEMBLA
North Cape
Greenland
ICELAND
Davis Strait
C. Farewell
ARCTIC CIRCLE
ASIA
EUROPE
Ural Mts.
St. Petersburg
BRITISH ISLES
London
North Sea
Berlin
Paris
PYRENEES
Gibraltar
ATLAS MTS.
Mediterranean Sea
Constantinople
Himalaya Mts.
Calcutta
Arabian Sea
Bay of Bengal
Alexandria
Cairo
AFRICA
Johannesburg
Cape Town
Cape of Good Hope
INDIAN OCEAN
East Cape
Prince of Wales
ALASKA
Rocky Mts.
Bering Sea
Hudson Bay
NORTH AMERICA
NEWFOUNDLAND
Chicago
UNITED STATES
New York
Washington
San Francisco
ATLANTIC OCEAN
CUBA
PORTO RICO
C. Verde
C. St. Roque
SOUTH AMERICA
Andes Mts.
Rio de Janeiro
Buenos Aires
Cape Horn
Peking
CHINA
Himalaya Mts.
JAPAN
Tokio
TROPIC OF CANCER
Hongkong
Manila
PHILIPPINE ISLANDS
GUAM
HAWAIIAN ISLANDS
PACIFIC OCEAN
Singapore
EQUATOR
EAST INDIA IS.
INDIAN OCEAN
OCEANICA
SAMOA
FIJI
TROPIC OF CAPRICORN
AUSTRALIA
Sydney
Melbourne
NEW ZEALAND
THE M-N. CO.

FIG. 360.

APPENDIX I

REFERENCES TO BOOKS, ARTICLES, ETC.[1]

Key to Abbreviations

Publishing Houses. — American Book Co., New York (A. B. C.); D. Appleton & Co., New York (Appleton); The Century Co., New York (Century); Educational Publishing Co., Boston (E. P. C.); The Ginn Co., Boston (Ginn); Harper and Bros., New York (Harper); Longmans, Green & Co., New York (L. G.); The Macmillan Co., New York (McM.); G. P. Putnam's Sons, New York (Putnam); Rand, McNally & Co., Chicago (R. McN.); Chas. Scribner's Sons, New York (Scribner); Silver, Burdett & Co., New York (S. B. C.).

Magazines, etc. — Bulletin American Geographical Society ($1.00 a number, $4.00 a year) New York (*Bull. A. G. S.*); Publications of the Bureau of American Republics, Washington, D. C. (*B. Amer. R.*); Canadian Magazine ($0.25), Toronto, Canada (*C. M.*); Cassier's Magazine ($0.25), New York (*Cass.*); Century Magazine ($0.35), New York (*Cent. Mag.*); Cosmopolitan ($0.10), Irvington, N. Y. (*Cos.*); Chautauquan ($0.25), Meadville, Pa. (*Chaut.*); Harper's Magazine ($0.25), New York (*H. M.*); McClure's ($0.10), New York (*McClure*); National Geographic Magazine ($0.25 a number, $2.00 a year, including membership to society), Washington, D. C. (*N. G. M.*); New England Magazine ($0.35), Boston (*N. E. M.*); Popular

[1] Many of the books referred to in the First Book of this series will be found of use for this volume also; but it has not seemed necessary to refer to all of these a second time. These references are not intended to be exhaustive: a few good books are selected, and others omitted because of their cost or for other reasons. In the case of the magazine articles, too, only a few of the many good ones are mentioned.

Science Monthly ($0.25), New York (*P. S. M.*); Scribner's Magazine ($0.35), New York (*S. M.*).

In referring to magazines the volume is given first, the page last, thus, Vol. 5. p. 69 = 5 : 69.

General. — For references to magazines and journals, see First Book, pp. 256–257. Mill, "Hints to Teachers Concerning the Choice of Geographical Books" (L. G., $1.25); "The Statesman's Year Book" (McM., $3.00); Mill, "The International Geography" (Appleton, $3.50); Herbertson, "Man and His Work" (McM., $0.50); Lyde, "Man and His Markets" (McM., $0.50); Geikie, "The Teaching of Geography" (McM., $0.60); Pratt, "American History Stories" (E. P. C., 4 vols., $0.36 each); Brooks, "Century Book for Young Americans" (Century, $1.50); Rocheleau, "Great American Industries" (C. A. Flanagan, Chicago, 2 vols., $0.50 each); Chase and Clow, "Stories of Industry" (E. P. C., 2 vols., $0.40 each); Coe, "Our American Neighbors" (S. B. C., $0.60); Ballou, "Footprints of Travel" (Ginn, $1.00); Smith, "Our Own Country" (S. B. C., $0.50); Carpenter, "Geographical Reader, North America" (A. B. C., $0.60); Carroll, "Around the World Geography Series," Book II. (The Morse Co., New York, $0.38); King, "Picturesque Geographical Readers" (Lee & Shepard, Boston, Vol. 2, $0.72, Vols. 3, 4 and 5 each $0.56); Ingersoll, "The Book of the Ocean" (Century, $1.50); Lyde, "A Geography of North America" (McM., $0.50); Reclus, "The Earth and Its Inhabitants," Vols. XV, XVI, and XVII, very valuable, but expensive (Appleton, $5.00 each); "Stanford's Compendium of Geography and Travel," North America, Vol. 1, "Canada" by Dawson; Vol. 2, "United States" by Gannett (Scribner, $4.50 each).

Section I. Physiography. — Shaler, "Outlines of the Earth's History" (Appleton, $1.75); Shaler, "The Story of Our Continent" (Ginn, $0.75); Shaler, "Aspects of the Earth" (Scribner, $2.50); Davis, "Physical Geography" (Ginn, $1.25); Tarr, "Elementary Physical Geography" (McM., $1.40, contains references to works on physiography); Tarr, "First Book of Physical Geography" (McM., $1.10); Tarr, "Elementary Geology" (McM., $1.40); Russell, "Rivers of North America" (Putnam, $2.00); Russell, "Lakes of North America" (Ginn, $1.50); Russell, "Glaciers of North America" (Ginn, $1.75); National Geographic Monographs (A. B. C., $2.50).

Sections II and III. — Books by Davis and by Tarr referred to in Section I; Ward, "Practical Exercises in Elementary Meteorology" (Ginn, $1.12).

Section IV. Ocean Currents, etc. — Books by Davis and by Tarr (See Sect. I); Shaler, "Sea and Land" (Scribner, $2.50); Pillsbury, "The Gulf Stream" (U. S. Coast Survey, Washington); Darwin, "Tides" (Houghton, Mifflin & Co., N. Y., $2.00); Guyot, "The Earth and Man" (Scribner, $1.75); "The Depths of the Sea" (*S. M.*, July, '92, 12:77); "How the Sea is Sounded" (*P. S. M.*, Jan., '94, 44:334).

Section V. Animals, Plants, etc. — "The Arid Regions of the United States" (*N. G. M.*, '93, 5:167); Wright, "Four-footed Americans" (McM., $1.50); Roosevelt, "Hunting Trips of a Ranchman" (Putnam, $3.00); Whitney, "On Snowshoes to the Barren Grounds" (Harper, $3.50); Heilprin, "The Geographical and Geological Distribution of Animals" (Appleton, $2.00); Ingersoll, "Wild Neighbors" (McM., $1.50); "How the Settlement of North America has affected Its Wild Animals" (*Bull. A. G. S.*, '85, 17:17); Shaler, "Nature and Man in America" (Scribner, $1.50); Shaler, "Domesticated Animals" (Scribner, $2.50).

The United States. — Gannett, "The Building of a Nation" (The H. T. Thomas Co., New York, $2.50); Baedeker, "The United States" (Scribner, $3.60); Tarr, "Economic Geology of the United States" (McM., $3.50); Channing, "Students' History of the United States" (McM., $1.40); MacCoun, "An Historical Geography of the United States" (Townsend MacCoun, New York, $1.00); Whitney, "The United States" (Little, Brown & Co., Boston, $2.00); Patton, "The Natural Resources of the United States" (Appleton, $3.00); King, "Handbook of the United States" (Moses King Corporation, Buffalo, N. Y., $2.50); "The Growth of the United States" (*N. G. M.*, '98, 9:377); "The Conduct of Great Businesses" (*S. M.*, several numbers, Vols. 21 and 22, 1897); "Distribution of Manufactures in the United States" (*Chaut.*, Sept., '98, 27 : 587); "Textile Industries of the United States" (*Chaut.*, March, 99, 28 : 538); "Modern Light House Service" (*Cass.*, Aug. and Sept., '94, 6:297 and 355); "The Life Saving Service" (*P. S. M.*, Jan., '94, 44:346).

Section VIII. New England. — Davis, "Physical Geography of Southern New England" (A. B. C., $0.20); "American Lumber"

(*Chaut.*, Feb., '99, 28:436); Thoreau, "The Maine Woods" (Houghton, Mifflin & Co., New York, $1.50); "Fishing Industries of the United States" (*Chaut.*, Jan., '98, 26:387); "New England Fisheries" (*N. E. M.*, Apr., '94, 10:229); Kipling, "Captains Courageous" Century, $1.50); "The Granite Industry in New England" (*N. E. M.*, Feb., '92, 5:742); "Cotton Manufactures of New England" (*Chaut.*, April, '93, 17:37); "Cotton Spinning in North and South" (*P. S. M.*, Oct., '90, 37:798); "The Manufacture of Wool," (*P. S. M.*, June, July, Aug., '91, 39:176, 289, and 454); "Leather Making" (*P. S. M.*, July, '92, 41:339); "The Manufacture of Boots and Shoes" (*P. S. M.*, Aug., '92, 41:496); "Boston at the Century's End" (*H. M.*, Nov., '99, 99:823).

Section IX. Middle Atlantic States. — Gilbert, "Niagara Falls and Their History" (A. B. C., $0.20); "The Coal Industry" (*Chaut.*, Jan., '93, 16:416); Articles on Iron and Steel (*Cass.*, five papers, July to Nov., '93, Vols. 4 and 5; Feb., '00, 17:259; *McClure*, June, '94, 3:3; *H. M.*, March, '94, 88:587); "The Manufacture of Iron" (*P. S. M.*, Dec., '90; Feb. and March, '91, 38:145, 449, and 586); "The Manufacture of Steel" (*P. S. M.*, Oct., Nov., '91, 39:729, and 40:15); Articles on Ship Building (*Cass.*, July, '92, 2:157; Aug., '97, 12:341, and 393; March, '98, 13:385); "Canning Industry in the United States" (*Chaut.*, Nov., '98, 28:126); "The Water Front of New York (*S. M.*, Oct., '99, 26:385); "The City of Homes" (*H. M.*, June, '94, 89:3); "The New Baltimore" (*H. M.*, Feb., '96, 92:331); "Washington Society" (*H. M.*, March and April, '93, 86:586 and 674).

Section X. Southern States. — Hayes, "The Southern Appalachians" (A. B. C., $0.20); Ralph, "Dixie, or Southern Scenes and Sketches" (Harper, $2.50, published originally in *H. M.*, 1892–95); Brooks, "Cotton, Its Uses, Culture, etc." (Spon and Chamberlain, New York, $3.00); "Culture and Preparation of Cotton in the United States" (*Cos.*, March, '93, 14:539); "Sugar in the United States" (*Chaut.*, June, '92, 15:290; Oct., '92, 16:36); "Rice and Its Culture" (*P. S. M.*, Oct., '90, 37:827); "The Old Dominion" (*H. M.*, Dec., '93, 88:4); "Subtropical Florida" (*S. M.*, March, '94, 15:345); "Texas" (*H. M.*, Sept., '93, 87:561); "An Indian Commonwealth" (Indian Territory) (*H. M.*, Nov., '93, 87:884).

Section XI. Central States. — Dryer, "Studies in Indiana Geography" (Inland Pub. Co., Indianapolis, Ind., $0.50); Hovey, "Celebrated Ameri-

can Caverns" (R. Clarke Co., Cincinnati, O., $2.00); "The Mammoth Cave" (*Cent. Mag.*, March, '98, 33 : 643): "The Development of Railroads in the United States" (*Chaut.*, Oct., '94, 20 : 1); "In White Pine Forests" (*Cass.*, Sept., '94, 6 : 408); "Wheat and Its Distribution" (*Cos.*, Nov. '98, 26 : 114); "Beet Sugar Industry in the United States" (Special Report, Department of Agriculture, Washington); "Ranching" (*H. M.*, Feb. and March, '94, 88 : 350 and 515); "The Chicago Packing Industry" (*Cos.*, Oct., '99, 27 : 599); "Copper Mining in the United States" (*Cass.*, Jan., '97, 11 : 215); "Chicago" (*S. M.*, June, '95, 17 : 663).

Section XII. Western States. — Parkman, "The Oregon Trail" (Little, Brown & Co., Boston, $1.00); "The New Northwest" (*H. M.*, Jan. '98, 96 : 299); Ralph, "Our Great West" (Harper, $2.50, published originally in *H. M.*, 1892–94); "The Pacific Coast Guide Book" (R. McN., $1.00); "The Grand Cañon" (*H. M.*, Aug., '98, 97 : 377); "The Great Walled River" (*Bull. A. G. S.*, '87, 19 : 113); "Gold and Silver Mining" (*Chaut.*, March, '97, 24 : 670); "From Mine to Mint" (*Cass.*, May, '94, 6 : 3); "Lumbering in the Northwest" (*Cos.*, May, '93, 15 : 63); "The Redwood Forest of the Pacific Coast" (*N. G. M.*, '99, 10 : 145); "The United States Forest Reserves" (*P. S. M.*, Feb., '98, 52 : 456); Newell, "Irrigation on the Great Plains" ('96 Year Book, Department of Agriculture, Washington, p. 197); "The Grape Gatherers" (*Cos.*, Oct., '99, 27 : 612); "Fruit Industry in California" (*P. S. M.*, Dec., '93, 44 : 200).

Section XII. Dependencies, etc., Alaska. — Scidmore, "Guide Book to Alaska" (Appleton, $1.25); Swineford, "Alaska" (R. McN., $1.00); "Alaska" (*B. Amer. R.*, $0.25); "Geographical Notes in Alaska" (*Bull. A. G. S.*, '96, 28 : 1); "Alaska" (*N. G. M.*, '98, 9 : 105–190, twelve articles); "Mountaineering in Alaska" (*Bull. A. G. S.*, '96, 28 : 217); "An Expedition Through the Yukon District" (*N. G. M.*, '92, 4 : 117); "Life on a Yukon Trail" (*N. G. M.* '99, 10 : 377 and 457); "The Rescue of the Whalers" (*H. M.*, June, '99, 99 : 3); "The Alaskan Boundary" (*N. G. M.*, '99, 10 : 425).

Cuba and Porto Rico. — See under West Indies, p. 443.

Hawaiian Islands. — Alexander, "A Brief History of the Hawaiian People" (A. B. C., $1.50); Whitney, "Hawaiian America" (Harper, $2.50); Young, "The Real Hawaii" (Doubleday and McClure Co., New York, $1.50); "Hawaii" (*B. Amer. R.*, $0.25); "Report of the

Hawaiian Commission" (State Department, Washington); "The Hawaiian Islands" (*Bull. A. G. S.*, '89, 21 : 149); Wallace, "Island Life" (McM., $1.75); Articles on Samoa (*N. G. M.*, '99, 10 : 207).

Philippines. — Worcester, "The Philippine Islands" (McM., $4.00); Younghusband, "The Philippines and Round About" (McM., $2.50); "Manila and the Philippines" (*S. M.*, July, '98, 24 : 12); "Life in Manila" (*Cent. Mag.*, Aug., '98, 34 : 563); "Report of the Philippine Commission" (State Department, Washington); Articles on the Philippines (*N. G. M.* '98, 9 : 257–304; '99, 10 : 33–72; '00 11 : 1); "The Philippine Islands" (*Bull. A. G. S.*, '83, 15 : 73).

Section XIV. Canada. — Hatton and Harvey, "Newfoundland" (Doyle and Whipple, Boston, $2.50); "The Relation of the United States and Canada" (Senate Reports, No. 1530, Washington); Ralph, "On Canada's Frontier" (Harper, $2.50, published originally in *H. M.*, 1892–95); Parkin, "The Great Dominion" (McM., $1.75); Baedeker, "The Dominion of Canada" (Scribner, $1.50); Canadian Guide Book, (Appleton, $1.00); Statistical Year Book (each year by Department of Agriculture, Ottawa); Canada, the Land of Water Ways" (*Bull. A. G. S.*, '90, 22 : 351); Articles on Lumbering (*C. M.*, April, '94, 2 : 549 and 556).

The Far North. — Mrs. Peary, "My Arctic Journal" (Contemporary Publishing Co., New York, $2.00); Hayes, "The Land of Desolation" (Harper, $1.75); Nansen, "First Crossing of Greenland" (L. G., $1.25); "Days in the Arctic" (*H. M.*, Sept., '98, 97 : 499); "The Glaciers of Greenland" (*P. S. M.*, Nov., '94, 46 : 1); "Greenland and the Greenlanders" (*P. S. M.*, July, '90, 37 : 302); "The Arctic Highlander" (*S. M.*, Feb., '92, 11 : 241); "A Day's Hunting Among the Eskimos" (*P. S. M.*, Feb., '95, 46 : 446); Boas, "A Year Among the Eskimo" (*Bull. A. G. S.*, '87, 19 : 383).

Section XV. Mexico. — "Guide to Mexico" (Appleton, $1.50); Baedeker, "The United States" (with an excursion into Mexico), (Scribner, $3.60); Bancroft, "Resources and Development of Mexico" (The Bancroft Co., San Francisco, $4.50); Romero, "Geographical and Statistical Notes on Mexico" (Putnam, $2.00); Romero, "Coffee and India Rubber Culture in Mexico" (Putnam, $3.00); "An Outpost of Civilization" (*H. M.*, Dec., '93, 88 : 71); Griffin, "Mexico of To-day" (Harper, $1.50); Lummis, "The Awakening of a Nation" (Harper, $2.50); "Mexico" (*B. Amer. R.*, $0.50).

Central America. — Belt, "Naturalist in Nicaragua" (Scribner and Welford, New York, $3.00); Calvo, "The Republic of Costa Rica" (R. McN., $2.00); Charles, "Honduras" (R. McN., $1.50); Handbooks (*B. Amer. R.*) on Costa Rica, Honduras, Salvador, and Nicaragua (each, $0.35, Guatemala, $0.25); Monthly Bulletins of the Same Bureau (each, $0.25) also contain information about American Republics; "Three Gringos in Central America" (*H. M.*, Sept. and Oct., '91, 91 : 490 and 730); "India Rubber and Gutta Percha" (*P. S. M.*, March, '97, 50 : 679); "Across Nicaragua" (*N. G. M.*, '89, 1 : 315); Articles on the Nicaragua Canal (*N. G. M.*, '99, 10 : 297).

West Indies. — Hill, "Cuba and Porto Rico" (Century, $3.00); Rodway, "The West Indies and the Spanish Main" (Putnam, $1.75); Kingsley, "At Last: A Christmas in the West Indies" (McM., $1.25); "The Foreign Commerce of Our Possessions," etc. (Treasury Department, Washington); Handbooks on Haiti and Santo Domingo (*B. Amer. R.*, $0.35, each); "Cuba" (*N. G. M.*, '98, 9 : 193); "Porto Rico" (*N. G. M.*, '99, 10 : 93); "Haiti the Unknown" (*H. M.*, Aug., '99, 99 : 365); "Havana since the Occupation" (*S. M.*, July,' 99, 26 : 86); "Aspects of Nature in the West Indies" (*S. M.*, July, '93, 14 : 101); "How the Bananas Grow" (*Cos.*, Feb., '98, 24 : 365); Heilprin, "The Bermuda Islands" (A. Heilprin, Philadelphia, $3.50).

Government Publications. — Only a very few references are made to the many government publications of geographic interest. There are far too many to refer to. For instance, the Smithsonian Institution Annual Report usually contains articles on geographic subjects, and the Fish Commission has published many excellent accounts of the different fishing industries. From the Weather Bureau are issued not merely weather maps, but Annual Reports and Monthly Weather Reviews.

Among the publications of the Geological Survey are reports upon Irrigation, Annual Reports containing many excellent accounts of the geology of interesting regions, especially mining regions, and also Annual Reports on the Mineral Resources of the country, with statistics. Besides these, the Geological Survey issues topographic maps (five cents each, or two cents by the hundred). A list of these maps can be obtained upon application, and the teacher may find a map of the region where the school is situated.

A great range of topics is covered by the various Annual Reports

(called Year Books) and Bulletins of the Department of Agriculture upon such subjects as farming, various crops, forestry, botany, mammals, irrigation, etc. Special reports of importance (some of which are referred to above) are issued by the Treasury Department, which also issues Statistical Abstracts on commerce, finance, population, etc. From the State Department, besides valuable special papers (like the Report of the Philippine Commission), are issued the Consular Reports, which have articles and notes upon foreign industries, etc. A wealth of geographical information is contained in the various Census volumes. Besides these, there are other reports, as that on the Precious Metals, issued annually by the Director of the Mint, the Report of the Bureau of Ethnology, and the Report of the Commissioner on Indian affairs. The maps of the United States Coast Survey will be found of value, especially in those schools located on the coast, which should certainly have the maps of their immediate locality. Many states also issue valuable reports on agriculture, mining, manufacturing, etc.

In order to find out about the government publications, one can often obtain a list of those issued by a given bureau by writing to the Superintendent of Public Documents, Washington. A monthly list of all government publications is also prepared by the Superintendent of Public Documents, thus permitting one to keep track of new publications. Some of the publications must be purchased, but many may be obtained by writing to one's congressman or senator, to whom copies are given for free distribution among constitutents. The great majority of government documents are issued for free distribution. Applications for these, in moderation, are invariably granted when needed for schools, provided the quota is not already exhausted.

APPENDIX II

TABLES OF AREA, POPULATION, ETC.

AREA AND POPULATION OF THE CONTINENTS

	Area in Square Miles		Estimated Population, 1900
Africa	11,508,793		170,000,000
Asia (with East Indies)	16,770,951		877,000,000
Australia	2,972,573	(1901)	3,767,443
Europe	3,855,828		376,400,000
North America	8,843,070		103,500,000
South America	7,681,420		41,200,000
Total	51,632,635		1,571,800,000

AREA AND POPULATION OF THE STATES AND TERRITORIES OF THE UNITED STATES, NOT INCLUDING ALASKA, ETC.

State	Date of Admission	Area in Square Miles	Population 1900
Alabama	1819	52,250	1,828,697
Arizona	Territory	113,020	122,931
Arkansas	1836	53,850	1,311,564
California	1850	158,360	1,485,053
Colorado	1876	103,925	539,700
Connecticut	O [1]	4,990	908,355
Delaware	O	2,050	184,735
District of Columbia	——	70	278,718
Florida	1845	58,680	528,542

[1] O means original state.

State	Date of Admission	Area in Square Miles	Population 1900
Georgia	O	59,475	2,216,331
Idaho	1890	84,800	161,772
Illinois	1818	56,650	4,821,550
Indiana	1816	36,350	2,516,462
Indian Territory	Territory	31,400	391,960
Iowa	1845	56,025	2,231,853
Kansas	1861	82,080	1,470,495
Kentucky	1792	40,400	2,147,174
Louisiana	1812	48,720	1,381,625
Maine	1820	33,040	694,466
Maryland	O	12,210	1,190,050
Massachusetts	O	8,315	2,805,346
Michigan	1837	58,915	2,420,982
Minnesota	1858	83,365	1,751,394
Mississippi	1817	46,810	1,551,270
Missouri	1821	69,415	3,106,665
Montana	1889	146,080	243,329
Nebraska	1867	77,510	1,068,539
Nevada	1864	110,700	42,335
New Hampshire	O	9,305	411,588
New Jersey	O	7,815	1,883,669
New Mexico	Territory	122,580	195,310
New York	O	49,170	7,268,012
North Carolina	O	52,250	1,893,810
North Dakota	1889	70,795	319,146
Ohio	1802	41,060	4,157,545
Oklahoma	Territory	39,030	398,245
Oregon	1859	96,030	413,536
Pennsylvania	O	45,215	6,302,115
Rhode Island	O	1,250	428,556
South Carolina	O	30,570	1,340,316
South Dakota	1889	77,650	401,570
Tennessee	1796	42,050	2,020,616
Texas	1845	265,780	3,048,710
Utah	1894	84,970	276,749
Vermont	1791	9,565	343,641
Virginia	O	42,450	1,854,184
Washington	1889	69,180	518,103
West Virginia	1863	24,780	958,800
Wisconsin	1848	56,040	2,069,042
Wyoming	1890	97,890	92,531

ESTIMATED AREA AND POPULATION OF SOME OF THE SECTIONS DESCRIBED IN THE TEXT

Name	Area	Population	Date
Alaska	590,884	63,592	1900
Bahama Islands	5,450	53,735	1901
British Honduras (Belize)	7,562	36,998	1900
Canada	3,653,946	5,369,666	1901
Costa Rica	22,996	309,683	1899
Cuba	41,655	1,572,797	1899
Guam	180	8,561	1887
Guatemala	48,290	1,574,340	1900
Haiti (island)	28,250	1,380,000	1897
Hawaii	4,210	46,843	1900
Hawaiian Islands	6,449	154,001	1900
Honduras	46,250	587,500	1900
Jamaica	4,200	745,104	1898
Luzon	40,024	3,442,941	1887
Mexico	767,005	13,545,462	1900
Newfoundland	42,200	210,000	1899
Nicaragua	49,200	500,000	1900
Philippine Islands	114,356	8,000,000	1900
Porto Rico	3,606	953,243	1899
St. Croix	84	19,783	1890
St. Thomas	32	12,019	1890
Salvador	7,225	1,006,848	1901
Tutuila	55	3,750	1891
United States (not including Alaska, etc.)	3,025,600	76,085,794	1900
United States (including Alaska, Philippine Islands, etc.)	3,741,074	85,268,941	1900

POPULATION OF THE FIFTEEN LARGEST CITIES OF THE COUNTRY

City	1800	1830	1890	1900
1. New York, N.Y.	60,489 (1)	197,112 (1)	1,515,301 (1)	3,437,202
2. Chicago, Ill.		4,470 (1840)	1,099,850 (2)	1,698,575
3. Philadelphia, Pa.	41,220 (2)	80,462 (3)	1,046,964 (3)	1,293,697
4. St. Louis, Mo.	10,049 (1820)	14,125	451,770 (4)	575,238
5. Boston, Mass.	24,937 (4)	61,392 (4)	448,477 (5)	560,892
6. Baltimore, Md.	26,514 (3)	80,620 (2)	434,439 (6)	508,957
7. Cleveland, O.	606 (1820)	1,076	261,353 (9)	381,768
8. Buffalo, N.Y.	2,095 (1820)	8,668	255,664 (10)	352,387
9. San Francisco, Cal.			298,997 (7)	342,782

City	1800	1830	1890	1900
10. Cincinnati, O.	2,540 (1810)	24,831 (7)	296,908 (8)	325,902
11. Pittsburg, Pa.	1,565	12,568	238,617 (12)	321,616
12. New Orleans, La.	17,242 (1810)	29,737 (6)	242,039 (11)	287,104
13. Detroit, Mich.	1,422 (1820)	2,222	205,876 (14)	285,704
14. Milwaukee, Wis.		1,172 (1840)	204,468 (15)	285,315
15. Washington, D.C.	3,210	18,826	230,392 (13)	278,718

POPULATION OF CITIES MENTIONED IN THE TEXT

	Where not otherwise stated Census of 1900	Census of 1890
Acapulco, Mexico	5,000 (1897)	
Albany, N.Y.	94,151	94,923
Albuquerque, N.M.	6,238	3,785
Allegheny, Pa.	129,896	105,287
Altoona, Pa.	38,973	30,337
Annapolis, Md.	8,402	7,604
Ann Arbor, Mich.	14,509	9,431
Asheville, N.C.	14,694	10,235
Ashland, Wis.	13,074	9,956
Astoria, Ore.	8,381	6,184
Atlanta, Ga.	89,872	65,533
Auburn, Me.	12,951	11,250
Auburn, N.Y.	30,345	25,858
Augusta, Ga.	39,441	33,300
Augusta, Me.	11,683	10,527
Austin, Tex.	22,258	14,575
Baltimore, Md.	508,957	434,439
Bangor, Me.	21,850	19,103
Bar Harbor, Me.		2,000
Bath, Me.	10,477	8,723
Baton Rouge, La.	11,269	10,478
Bay City, Mich.	27,628	27,839
Berkeley, Cal.	13,214	5,101
Biddeford, Me.	16,145	14,443
Billings, Mont.	3,221	836
Binghamton, N.Y.	39,647	35,005
Birmingham, Ala.	38,415	26,178
Boston, Mass.	560,892	448,477
Bradford, Pa.	15,029	10,514
Bridgeport, Conn.	70,996	48,866
Brockton, Mass.	40,063	27,294
Brooklyn, N.Y. (now part of New York)		806,343
Brunswick, Ga.	9,081	8,459
Buffalo, N.Y.	352,387	255,664

	Where not otherwise stated, Census of 1900	Census of 1890
Burlington, Vt.	18,640	14,590
Butte, Mont.	30,470	10,723
Calgary, Canada	4,152 (1901)	
Cambridge, Mass.	91,886	70,028
Camden, N.J.	75,935	58,313
Charleston, S.C.	55,807	54,955
Charlotte, N.C.	18,091	11,557
Charlottetown, Canada	12,080 (1901)	
Chattanooga, Tenn.	32,490	29,100
Chelsea, Mass.	34,072	27,909
Chester, Pa.	33,988	20,226
Cheyenne, Wyo.	14,087	11,690
Chicago, Ill.	1,698,575	1,099,850
Cincinnati, O.	325,902	296,908
Cleveland, O.	381,768	261,353
Colon, Colombia	3,000 (1897)	
Colorado Springs, Colo.	21,085	11,140
Columbia, S.C.	21,108	15,353
Columbus, Ga.	17,614	17,303
Columbus, O.	125,560	88,150
Concord, N.H.	19,632	17,004
Council Bluffs, Ia.	25,802	21,474
Covington, Ky.	42,938	37,371
Cripple Creek, Colo.	10,147	
Dallas, Tex.	42,638	38,067
Danville, Va.	16,520	10,305
Davenport, Ia.	35,254	26,872
Dawson, Canada	9,142 (1901)	
Dayton, O.	85,333	61,220
Denver, Colo.	133,859	106,713
Des Moines, Ia.	62,139	50,093
Detroit, Mich.	285,704	205,876
Dover, Del.	3,329	
Dover, N.H.	13,207	12,790
Dubuque, Ia.	36,297	30,311
Duluth, Minn.	52,969	33,115
Durham, N.C.	6,679	5,485
Elizabeth, N.J.	52,130	37,764
Elmira, N.Y.	35,672	30,893
El Paso, Tex.	15,906	10,338
Erie, Pa.	52,733	40,634
Evansville, Ind.	59,007	50,756
Fall River, Mass.	104,863	74,398
Findlay, O.	17,613	18,553
Fitchburg, Mass.	31,531	22,037

	Where not otherwise stated, Census of 1900		Census of 1890
Fort Worth, Tex.	26,688		23,076
Fredericton, Canada	7,117	(1901)	
Galveston, Tex.	37,789		29,084
Gloucester, Mass.	26,121		24,651
Grand Rapids, Mich.	87,565		60,278
Greeley, Colo.	3,023		2,395
Greenville, S.C.	11,860		8,607
Guatemala, Guatemala	72,102	(1893)	
Guthrie, Oklahoma	10,006		2,788
Halifax, Canada	40,787	(1901)	
Hamilton, Bermuda	2,246	(1901)	
Hamilton, Canada	52,550	(1901)	
Harrisburg, Pa.	50,167		39,385
Hartford, Conn.	79,850		53,230
Havana, Cuba	235,981	(1899)	
Haverhill, Mass.	37,175		27,412
Helena, Mont.	10,770		13,834
Hilo, Hawaiian Is.	19,785		
Hoboken, N.J.	59,364		43,648
Holyoke, Mass.	45,712		35,637
Honolulu, Hawaiian Is.	39,306		
Hot Springs, Ark.	9,973		8,086
Houston, Tex.	44,633		27,557
Indianapolis, Ind.	169,164		105,436
Ishpeming, Mich.	13,255		11,197
Ithaca, N.Y.	13,136		11,097
Jacksonville, Fla.	28,429		17,201
Jamestown, N.Y.	22,802		16,038
Jefferson City, Mo.	9,664		6,742
Jersey City, N.J.	206,433		163,003
Joplin, Mo.	26,023		9,943
Juneau, Alaska	1,864		1,253
Kansas City, Mo.	163,752		132,716
Key West, Fla.	17,114		18,080
Kingston, Canada	17,961	(1901)	
Kingston, Jamaica	46,542	(1898)	
Knoxville, Tenn.	32,637		22,535
La Crosse, Wis.	28,895		25,090
Lancaster, Penn.	41,459		32,011
Laramie, Wyo.	8,207		6,388
Lawrence, Mass.	62,559		44,654
Leadville, Colo.	12,455		10,384
Lewiston, Me.	23,761		21,701
Lexington, Ky.	26,369		21,567
Lincoln, Neb.	40,169		55,154

	Where not otherwise stated, Census of 1900	Census of 1890
Little Rock, Ark.	38,307	25,874
Lockport, N.Y.	16,581	16,038
London, Canada	37,983 (1901)	
Los Angeles, Cal.	102,479	50,395
Louisville, Ky.	204,731	161,129
Lowell, Mass.	94,969	77,696
Lynchburg, Va.	18,891	19,709
Lynn, Mass.	68,513	55,727
Macon, Ga.	23,272	22,746
Malden, Mass.	33,664	23,031
Manchester, N.H.	56,987	44,126
Manila, Philippine Is.	350,000 (1901)	
Marquette, Mich.	10,058	9,093
Matanzas, Cuba	45,282 (1899)	
Memphis, Tenn.	102,320	64,495
Meriden, Conn.	24,296	21,652
Mexico, City, Mexico	344,377 (1895)	
Milwaukee, Wis.	285,315	204,468
Minneapolis, Minn.	202,718	164,738
Mobile, Ala.	38,469	31,076
Montgomery, Ala.	30,346	21,883
Montreal, Canada	266,826 (1901)	
Nashua, N.H.	23,898	19,311
Nashville, Tenn.	80,865	76,168
Nassau, Bahama	11,000 (1891)	
Natchez, Miss.	12,210	10,101
Newark, N.J.	246,070	181,830
New Bedford, Mass.	62,442	40,733
New Haven, Conn.	108,027	81,298
New Orleans, La.	287,104	242,039
Newport, Ky.	28,301	24,918
Newport, R.I.	22,034	19,457
Newport News, Va.	19,635	4,449
New York City, N.Y.	3,437,202	1,515,301
Niagara Falls, N.Y.	19,457	5,502
Nome City, Alaska	12,486	
Norfolk, Va.	46,624	34,871
Norristown, Pa.	22,265	19,791
Oakland, Cal.	66,960	48,682
Ogden, Utah	16,313	14,889
Oil City, Pa.	13,264	10,932
Oklahoma, Oklahoma	10,037	4,151
Olean, N.Y.	9,462	7,358
Omaha, Neb.	102,555	140,452
Oshkosh, Wis.	28,284	22,836

	Where not otherwise stated, Census of 1900	Census of 1890
Oswego, N.Y.	22,199	21,842
Ottawa, Canada	59,902 (1901)	
Panama, Colombia	30,000 (1886)	
Paterson, N.J.	105,171	78,347
Pawtucket, R.I.	39,231	27,633
Pensacola, Fla.	17,747	11,750
Peoria, Ill.	56,100	41,024
Peterboro, Canada	11,239 (1901)	
Philadelphia, Pa.	1,293,697	1,046,964
Phœnix, Ari.	5,544	3,152
Pittsburg, Pa.	321,616	238,617
Pittsfield, Mass.	21,766	17,281
Ponce, Porto Rico	27,952 (1899)	
Port Arthur, Canada	2,698 (1891)	
Port au Prince, Haiti	60,000 (1897)	
Portland, Me.	50,145	36,425
Portland, Ore.	90,426	46,385
Portsmouth, N.H.	10,637	9,827
Poughkeepsie, N.Y.	24,029	22,206
Providence, R.I.	175,597	132,146
Provincetown, Mass.	4,247	4,642
Pueblo, Colo.	28,157	24,558
Puebla, Mex.	91,917 (1895)	
Quebec, Canada	68,834 (1901)	
Quincy, Ill.	36,252	31,494
Quincy, Mass.	23,899	16,723
Raleigh, N.C.	13,643	12,678
Reading, Pa.	78,961	58,661
Richmond, Va.	85,050	81,388
Roanoke, Va.	21,445	16,159
Rochester, N.Y.	162,608	133,896
Rome, Ga.	7,291	6,957
Rutland, Vt.	11,499	11,760
Sacramento, Cal.	29,282	26,386
Saginaw, Mich.	42,345	46,322
St. Augustine, Fla.	4,272	4,742
St. John, Canada	40,711 (1901)	
St. John's, Newfoundland	29,007 (1899)	
St. Joseph, Mo.	102,979	52,324
St. Louis, Mo.	575,238	451,770
St. Paul, Minn.	163,065	133,156
Salem, Mass.	35,956	30,801
Salem, Ore.	4,258	10,475
Salt Lake City, Utah	53,531	44,843
San Antonio, Tex.	53,321	37,673

	Where not otherwise stated, Census of 1900	Census of 1890
San Diego, Cal.	17,700	16,159
San Francisco, Cal.	342,782	298,997
San José, Cal.	21,500	18,060
San Juan, Porto Rico	32,048 (1899)	
San Luis Potosi, Mexico	69,676 (1895)	
San Salvador, Salvador	59,540 (1900)	
Sante Fé, N.M.	5,603	6,185
Santiago, Cuba	43,090 (1899)	
Santo Domingo, Santo Domingo	20,000 (1900)	
Sault Ste. Marie, Mich.	10,538	5,760
Savannah, Ga.	54,244	43,189
Schenectady, N.Y.	31,682	19,902
Scranton, Pa.	102,026	75,215
Seattle, Wash.	80,671	42,837
Shreveport, La.	16,013	11,979
Sitka, Alaska	1,396	1,190
Somerville, Mass.	61,643	40,152
Spokane, Wash.	36,848	19,922
Springfield, Mass.	62,059	44,179
Springfield, O.	38,253	31,895
Stockton, Cal.	17,506	14,424
Superior, Wis.	31,091	11,983
Syracuse, N.Y.	108,374	88,143
Tacoma, Wash.	37,714	36,006
Tampa, Fla.	15,839	5,532
Tampico, Mexico	9,885 (1894)	
Taunton, Mass.	31,036	25,448
Toledo, O.	131,822	81,434
Topeka, Kan.	33,608	31,007
Toronto, Canada	207,971 (1901)	
Trenton, N.J.	73,307	57,458
Troy, N.Y.	60,651	60,956
Tucson, Ari.	7,531	5,150
Upernivik, Greenland	700 (1870)	
Utica, N.Y.	56,383	44,007
Vancouver, Canada	26,196 (1901)	
Vera Cruz, Mexico	88,993 (1895)	
Vicksburg, Miss.	14,834	13,373
Victoria, Canada	20,821 (1901)	
Virginia City, Nev.	2,695	8,511
Waltham, Mass.	23,481	18,707
Washington, D.C.	278,718	230,392
Waterbury, Conn.	45,859	28,646
Watertown, N.Y.	21,696	14,725
Wheeling, W. Va.	38,878	34,522

	Where not otherwise stated, Census of 1900	Census of 1890
Wichita, Kan.	24,671	23,853
Wilkes Barre, Pa.	51,721	37,718
Williamsport, Pa.	28,757	27,132
Wilmington, Del.	76,508	61,431
Windsor, Canada	12,153 (1901)	
Winnipeg, Canada	42,336 (1901)	
Winona, Minn.	19,714	18,208
Woonsocket, R.I.	28,204	20,830
Worcester, Mass.	118,421	84,655
Yarmouth, Canada	6,430 (1901)	
Yonkers, N.Y.	47,931	32,033

PRINCIPAL COUNTRIES FROM WHICH OUR FOREIGN-BORN POPULATION HAS COME

Country of Birth	Number in 1900
Germany	2,666,990
Ireland	1,618,567
Canada and Newfoundland	1,181,255
England	842,078
Sweden	573,040
Italy	484,207
Russia	424,096
Poland	383,510
Norway	336,985
Scotland	233,977
Total of foreign-born population	10,356,644

DISTRIBUTION OF NEGROES IN THE FIFTEEN STATES WHERE THEY ARE MOST NUMEROUS

States	Number of Negroes in 1900	Percentage of Negroes to total population, 1900
1. Georgia	1,034,813	46.69
2. Mississippi	907,630	58.50
3. Alabama	827,307	45.24
4. South Carolina	782,321	58.36
5. Virginia	660,722	35.63
6. Louisiana	650,804	47.10
7. North Carolina	624,469	32.97
8. Texas	620,722	20.36
9. Tennessee	480,243	23.77

States	Number of Negroes in 1900	Percentage of Negroes to total population, 1900
10. Arkansas	366,856	27.97
11. Kentucky	284,706	13.25
12. Maryland	235,064	19.75
13. Florida	230,730	43.65
14. Missouri	161,234	5.18
15. Pennsylvania	156,845	2.48

Total number of Negroes in 1900, 8,840,789.

FIVE LEADING EXPORTS OF UNITED STATES

Articles	Value, 1900
Cotton (mainly unmanufactured)	$265,836,000
Breadstuffs (including wheat, corn, flour, etc.)	262,744,000
Meat and dairy products	184,453,000
Iron, steel, and manufactures	121,914,000
Mineral oils	75,612,000
Total value of five leading exports, 1900	910,559,000

TEN LEADING IMPORTS OF UNITED STATES

Articles	Value, 1900	Principal Countries from which they come
Sugar and molasses	$101,141,000	East Indies, Hawaiian Islands, Cuba, Germany (beet sugar).
Silk, and manufactures of	76,224,000	Japan, France, China, Italy.
Hides and skins	57,936,000	East Indies, South America, Gt. Britain, France.
Fibre, and manufactures of	57,933,000	Mexico, Philippines, East Indies.
Chemicals, drugs, etc.	53,705,000	Germany, East Indies, Great Britain.
Coffee	52,468,000	Brazil, Central America, East Indies, Mexico.
Cotton, mainly manufactures of	49,502,000	Great Britain, Germany, Switzerland, France.
Wool, and manufactures of	36,425,000	Great Britain, Germany, France, South America.
Rubber and rubber goods	33,860,000	Brazil, Great Britain.
Fruits and nuts	19,264,000	Italy, Central America, West Indies.
Total value of ten leading imports, 1900		$849,941,000

FIVE PRINCIPAL COUNTRIES TO WHICH EXPORTS FROM THE UNITED STATES ARE SENT

Country	Value, 1900	Principal Materials
Great Britain	$527,784,340	Cattle, corn, wheat, flour, cotton, oil.
Germany	184,648,094	Corn, cotton, oil, lard.
Canada	90,045,256	Corn, wheat, coal.
Netherlands	89,116,242	Corn, wheat, flour, coffee.
France	81,993,909	Corn, wheat, cotton, oil.

SOME OF THE LARGE RIVERS

Name	Approximate Length in Miles	Approximate Basin Area Square Miles	Ocean
Mississippi (including Missouri)	4,300	1,257,000	Atlantic
Missouri	3,000	527,155	Atlantic
St. Lawrence	2,200	530,000	Atlantic
Mackenzie	2,000	590,000	Arctic
Arkansas	2,170	185,671	Atlantic
Yukon	2,000	440,000	Pacific
Colorado	2,000	225,049	Pacific
Rio Grande	1,800	240,000	Atlantic
Nelson-Saskatchewan	1,732	432,000	Atlantic
Columbia	1,400	216,537	Pacific
Ohio	975	201,720	Atlantic
Platte	900	90,011	Atlantic
Connecticut	450	11,269	Atlantic
James	450	9,684	Atlantic
Potomac	400	14,479	Atlantic
Sacramento	400	58,824	Pacific
Susquehanna	400	27,655	Atlantic
Delaware	300	12,012	Atlantic
Hudson	300	13,366	Atlantic
Penobscot	300	8,934	Atlantic

SOME FACTS (APPROXIMATE) CONCERNING THE LARGEST LAKES

Name	Length in Miles	Greatest Breadth in Miles	Area in Square Miles	Greatest Depth	Elevation
Superior	390	160	30,829	1,008	602
Huron	270	105	22,322	750	582

Name	Length in Miles	Greatest Breadth in Miles	Area in Square Miles	Greatest Depth	Elevation
Michigan . .	335	85	21,729	870	582
Great Bear . .	175	45	11,200		200
Great Slave . .	300	80	10,100		over 650
Erie . . .	246	58	9,900	210	573
Winnipeg . .	260	65	9,400		710
Ontario . .	190	55	7,104	738	247
Manitoba . .	122	24	1,850		810
Nicaragua . .	92	34	3,600	83	110
Champlain . .	125	10		280	101

ELEVATION OF SOME OF THE HIGHEST MOUNTAIN PEAKS

	Height in Feet
Mt. McKinley, Alaska (highest known on continent) . .	20,464
Mt. St. Elias, Alaska	18,100
Mt. Logan, Canada (highest known in Canada) . . .	19,539
Mt. Hooker, Canada	13,500
San Francisco Mountain, Arizona	12,794
Mt. Whitney, California (highest in the West) . . .	14,898
Mt. Shasta, California	14,380
Pikes Peak, Colorado	14,108
Mt. Hood, Oregon	11,225
Mt. Rainier, Washington	14,526
Fremont Peak, Wyoming	13,790
Mt. Mitchell, North Carolina (highest in East) . . .	6,711
Mt. Washington, New Hampshire (highest in Northeast) .	6,293
Mt. Marcy, New York	5,344
Mt. Katahdin, Maine	5,200
Mt. Monadnock, New Hampshire	3,186
Orizaba, Mexico (highest in Mexico)	18,314
Popocatepetl, Mexico	17,798
Pico del Turquino, Cuba	8,600
Yunque, Porto Rico	3,609
Blue Mountain Peak, Jamaica.	7,360
Mt. Tina, Haiti	10,300
Mauna Kea, Hawaii	13,805
Mauna Loa, Hawaii	13,675
Apo, Mindanao Island, Philippines.	10,312
Mayon, Luzon Island, Philippines	8,900

INDEX AND PRONOUNCING VOCABULARY

KEY TO PRONUNCIATION

a, as in *fat;* *ā*, as in *fate;* *ä*, as in *far;* *â*, as in *fall;* *e*, as in *pen;* *ē*, as in *mete;* *ė*, as in *her;* *i*, as in *pin;* *ī*, as in *pine;* *o*, as in *not;* *ō*, as in *note;* *ö*, as in *move;* *u*, as in *tub;* *ū*, as in *mute;* *u̇*, as in *pull;* *g*, as in *get;* *ġ*, as in *gem;* *c*, as in *cat;* *ç*, as in *cent.*

A double dot under a, e, or o (a̤, e̤, o̤) indicates that its sound is shortened to that of *u* in *but.*

Italicized letters are silent. The sign ′ tells upon which syllable the accent is placed. The numbers refer to pages in the book excepting where Fig. is before them, when they refer to figures in the book.